

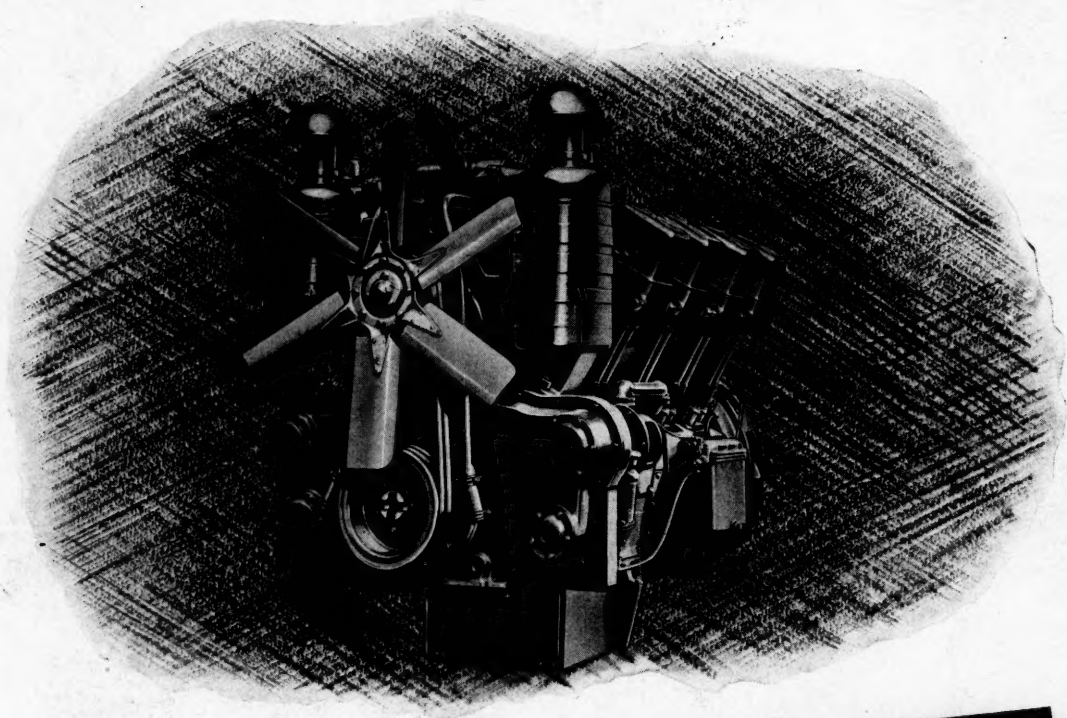


MARINE CORPS GAZETTE



DEFENSE NUMBER

JUNE, 1941



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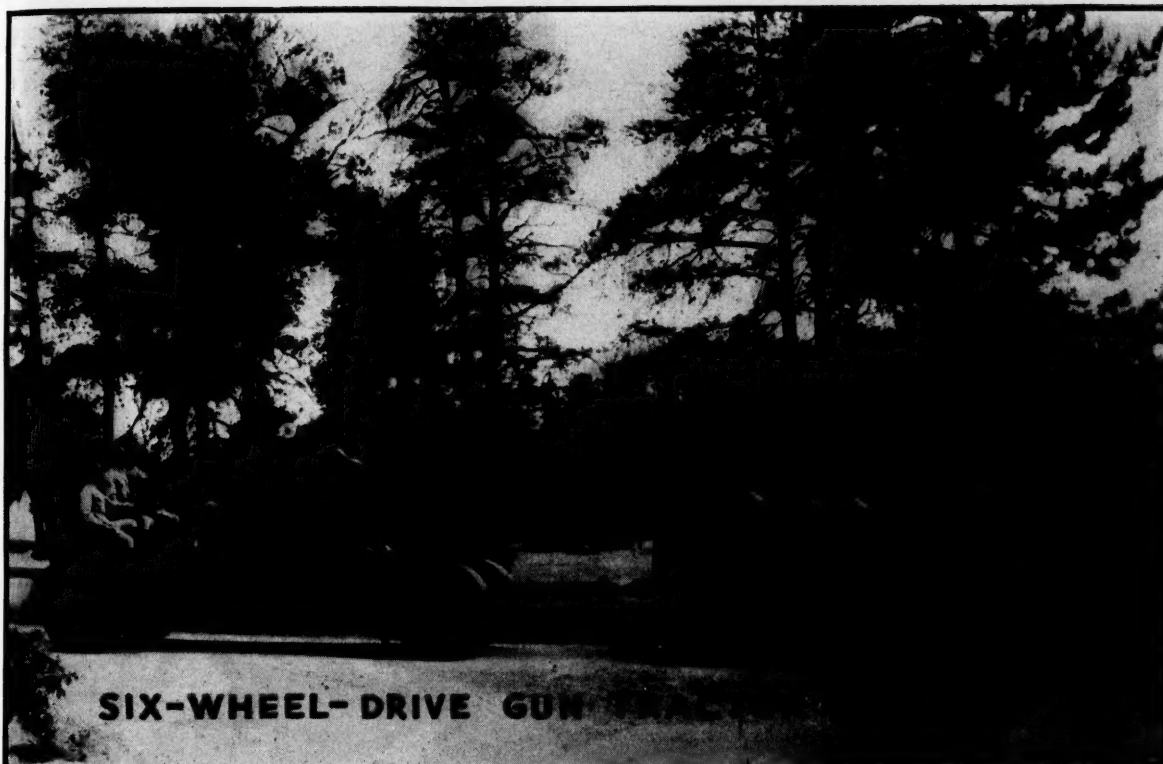
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THE MARINE CORPS GAZETTE

WASHINGTON, D. C.

Vol. 25

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No. 2

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MARINE CORPS AVIATION

By

LIEUTENANT COLONEL HAROLD C. MAJOR

U. S. Marine Corps

NOT so long ago, military aviation was considered to be a desirable adjunct to a well balanced military or naval force, but many believed that the striking power of aircraft was grossly exaggerated and that its value was questionable. Events abroad during the past year have demonstrated that aircraft in sufficient numbers, when properly co-ordinated with ground forces, can greatly influence the result of military operations.

Together with the other armed forces of the United States, the Marine Corps is being expanded and Marine Corps Aviation is keeping pace with the Marine Corps and with Naval Aviation. The General Board of the Navy made recommendations as to the number and type of airplanes required in Marine Aviation, and the Horne Board of 1941 made a report of personnel necessary to operate these airplanes. Some changes in the organization have been recommended and approved, and plans are going forward to effect the expansion as rapidly as training facilities permit.

Probably the most difficult phase of a program such as this, is the technical and practical training of enlisted men. There are forty-eight general classifications of duties for enlisted personnel such as, machinists, radiomen, ordnance-men, metalsmiths, etc., and each individual must have a good working knowledge of his specialty.

The modern airplane hardly resembles its predecessor of a few years ago. New engines develop many times the power and speed of the old, and structures are considerably heavier, stronger, and more complex. The aircraft mechanic of today, who knows and does his job on these planes, can be justly proud of a worthwhile accomplishment, and the Marine Corps is fortunate to have a well trained nucleus of such men.



A section of the latest type of Marine Corps Fighting Planes

It is contemplated that several thousand new enlisted men will be assigned to Aviation during the fiscal year 1942. All of these men must be trained in a specialty during the year in order that competent crews can take over and maintain the new aircraft as they are received. A great many more enlisted pilots will be required under the new program. Applicants will be selected from enlisted men who have six months or more service in Aviation.

Existing plans call for the training of more than a thousand pilots for the Marine Corps during the next year. These will consist of enlisted men, reserve officers (ex-cadets), and regular officers. All of these men are trained at Naval Training Centers, and receive the same ground school and flight training as do student pilots of the Navy.

The existing emergency has created a shortage of flight instructors, consequently a large majority of Marine Corps pilots who graduate from Training Centers are now being utilized as instructors, after receiving a course at the In-



Taking a camera aboard a Marine Corps reconnaissance airplane, preparatory to a photographic mission

structors' School. Later on these pilots will join the tactical organizations with considerable flying experience to their credit.

The tactical flying performed by Marine Aviators is extremely varied and, therefore, most interesting. Co-ordination with ground forces is of the utmost importance and thorough indoctrination and training in this phase is carried out by each unit. Marine Squadrons are also trained for operations at sea, aboard carriers. While not permanently assigned to a specific carrier, all tactical units qualify aboard periodically and participate in exercises at sea.

The one aviation mission of U. S. forces, for which only Marines are trained, is aviation support of a landing force. Many problems of close co-ordination with ground forces have been worked out and with the modern equipment now being supplied, the Marine Landing Force can be assured of efficient air support.

Parachute Troops are not new to the Marine Corps. Fourteen years ago twelve men, with light equipment, jumped from a transport plane in ten seconds. Intensive training of parachute troops began only a few months ago, and the Marine Corps now has several organizations ready for use.

Balloon barrages have been very efficient abroad in the defense of areas. Their mission is, of course, to prevent hostile dive bombers from diving low enough to bomb efficiently. Balloon cables will slice completely through the wing of a diving plane, hence pilots give them a wide berth. Barrage balloons are entirely new to the Marine Corps,

but an aviator was located that had had considerable experience with both free and kite balloons, and he is now organizing a number of units of Barrage balloons.

Marine Corps Aviation is very closely affiliated with Naval Aviation. The Marines are approximately ten per cent of Naval Aviation in airplanes, pilots, and mechanics. The Navy furnishes all material, airplanes, shops and equipment, transportation, fuel, armament, etc. In order to facilitate co-ordination between the Marine Corps and the Bureau of Aeronautics and the many other bureaus of the Navy which are concerned with procurement and operations of aircraft, the "Division of Marine Aviation" functions directly under the Chief of the Bureau of Aeronautics and the Major General Commandant. The Division consists of five officers under the Director, Colonel R. J. Mitchell, and a clerical force.

In addition to the Division of Aviation, there are two Marine aviators attached to Marine Corps Headquarters and six in the Bureau of Aeronautics. All of the latter perform duties in planning sections or on technical assignments in the Engineering Division of the Bureau of Aeronautics. Marine aviators are also assigned to two Navy test sections.

It has long been the policy that the Marine Corps select reserve officers or cadets, make them Marines, and then send them to Training Centers for flight training. Recently a new policy has been adopted for procurement of reserve officers for Marine Aviation which follows very closely the method of procuring regular Marine officers from the Naval Academy. Applicants for both Marine Corps and Naval Aviation are enlisted as seaman second class at one of the many Naval Reserve Bases, and are given one month of preliminary flight training. If they successfully complete this course, they are designated Naval Aviation Cadets and transferred to one of the advanced training centers.

Before the completion of this course, individuals state their preference for Navy or Marine Corps Aviation. From those volunteering for the Marine Corps, the required number will be selected by a Board, and upon completion of the course they will be commissioned as Second Lieutenants.

In order to assist in the procurement and in the primary training of these future cadets, a Marine Corps Aviation Unit has been established at each Naval Reserve Aviation Base. Each unit consists of three Marine Aviation officers and eight experienced aviation enlisted men. All Marine personnel are directly under the command of the Base Commander, and are used for procurement of personnel, instructing, administration, etc.

A Wing and Wing Headquarters Squadron are being formed in both the First and Second Marine Divisions. The Wing Commander will exercise both tactical and administrative command over all aviation organizations within the Division to which the Wing is assigned. As additional airplanes become available, new squadrons will be formed within each wing. If present plans materialize, all units of both wings will be formed in about one year.

Each Wing consists of a Headquarters Squadron and two or more groups. Marine Aviation Groups have been and are now composed of squadrons each operating aircraft

of a different type, as one fighting, one bombing, one scouting, one observation, and one utility squadron. The new Wing Organization will consist of Groups, each operating squadrons of the same type.

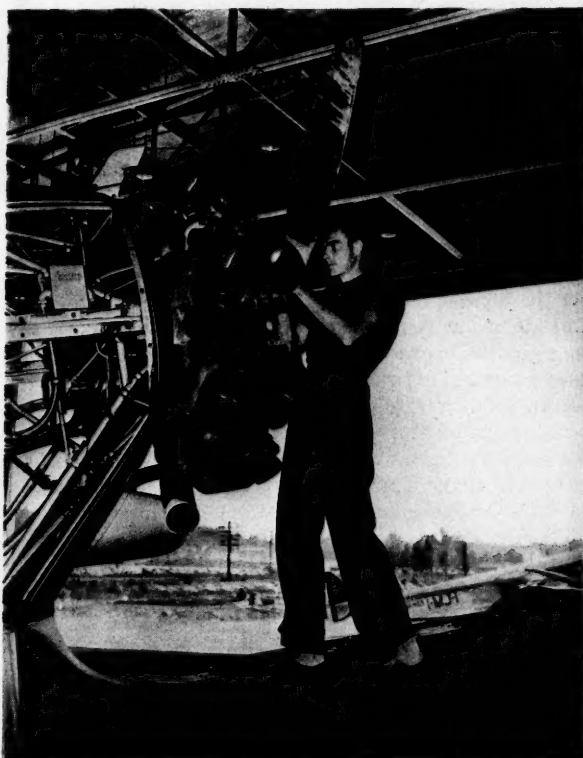
In order to insure as little interference as possible with squadron operation, a Headquarters and Service Squadron is authorized for each Group. Items of a minor nature, such as adjustments, replacements of small parts, and engine and aircraft checks, are performed by the squadrons. Repairs or replacements requiring considerable time or the use of shop equipment are turned over to the Group, and the work is accomplished in the Group Headquarters and Service Squadron. Each squadron has a limited number of spare airplanes which are operated only when replacements are required for those out of commission for some time.

Major overhaul of engines and airplanes is not performed in the field. Facilities for major overhaul consist of a machine shop, metal shop, fabric shop, electrical shop, instrument shop, engine overhaul, paint shop, and others. It is readily apparent that such facilities are not mobile. Marine Corps Aviation is charged with the major overhaul of all Marine engines and airplanes, and one Base Air Detachment is authorized to perform such work for each Wing.

Base Air Detachment One at Quantico and Base Air Detachment Two at San Diego now do the major overhaul for the First and Second Groups, respectively. Both will be greatly expanded to take care of the overhaul of aircraft of the New Wings, and training of personnel for



Taking balloon soundings to determine direction and velocity of wind at all altitudes for use of pilots in cross country flying, and in predicting weather conditions



Checking valves on the engine of a Marine amphibian airplane

these organizations is a large undertaking which must be accomplished within the Base Air Detachments themselves. Skilled men cannot be recruited, inexperienced men must be trained.

Brown and Turner Fields at Quantico now comprise the principal Marine Aviation Base on the East Coast. Funds are being requested for, and it is hoped to start construction of, a large new aviation base in North Carolina in the vicinity of the Marine Corps Training Base at New River. This base is designed for the operation of the First Marine Air Wing, and will include major overhaul facilities for Base Air Detachment One. The base will be situated adjacent to the water so that seaplane facilities will also be available. Proximity to the ocean will permit of necessary gunnery and bombing ranges, neither of which exist in the vicinity of Quantico. Facilities for the Second Wing will be made available at San Diego or in that vicinity.

The contemplated expansion of Marine Aviation will be a complicated and most difficult task which will require the utmost co-operation of all even remotely connected with it. Experienced officers and men will be at a premium, and each organization will have a minimum of such personnel. The expansion can and will be accomplished, and when completed will convince all hands that "Aviation is here to stay."

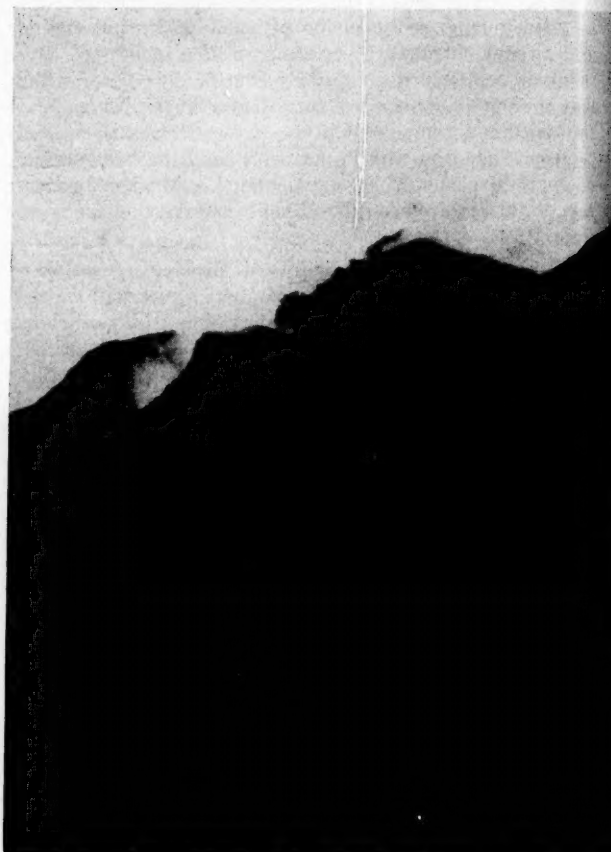
Some Experiences in Free China

BY MAJOR F. J. McQUILLEN, *U.S.M.C.*

AFTER I had completed about two and a half years of our three-year course in Chinese, I was, last Spring, appointed an Assistant Naval Attache to our Embassy in China. I continued on duty in Peiping for three more months, then was sent to take over our branch office at the Chungking Embassy. I left Peiping in mid-August and travelled via Shanghai, Hong Kong, and French Indo-China. The quickest way to Chungking is to fly in from Hong Kong via the American-managed (and exceptionally reliable) China National Airways. But important developments seemed pending in Indo-China and Yunnan, so that was the route I followed. It was late August when I arrived in Indo-China and a Japanese "Mission" was then in Hanoi, attempting to obtain various concessions from a reluctant French Governor. It was not hard to see that trouble was brewing, and I was somewhat concerned lest the railroad to Yunnan be interrupted before I could get over the border and into Free China. Service on that railroad had just been restored following an interruption of two or three weeks because of washouts. However, no crisis seemed imminent at the moment, so allowed myself five days in Indo-China. I spent that time in Hanoi and vicinity, part of it in checking up on the several pieces of luggage I had accumulated en route. In Hong Kong I had laid in several cases of household supplies such as tinned butter, condiments, cigarettes, plus a couple of cases of whiskey, for I knew that foreign products are practically unobtainable in Chungking and that I had either to bring such articles in with me or do without. So much luggage was something of a nuisance en route, especially in Indo-China where the native Annamites are ingenious at opening trunks and boxes in transit, extracting a portion of the contents, then closing said trunk or box up again so that it appears sound and whole. But by exercising considerable vigilance I was able to pass through without losing any part of my precious dunnage.

I found Hanoi a quiet, cleanly, tropical city. It is nicely laid out with wide, straight streets lined with trees, and has a couple of small lakes within the city that are bordered by pleasant parks. The heat was oppressive, but so was it all along the way I had come. I had already sweltered in Shanghai and Hong Kong so I didn't particularly mind the heat of Hanoi. It was no hotter than the other places I had just passed through. Though the Japanese were then threatening and cajoling, there was little sign of unusual military preparation for a possible attack. Sandbags that provided some protection for public buildings had obviously been in place for months, and shallow trenches that were intended as partial protection from air raids had long since been overgrown with weeds.

It happened that in Hanoi at this time there were, also, the American Consul at Kunming, China, with his wife and two months old baby, and a new Second Secretary on his way to our Embassy at Chungking. By way of showing solicitude for the comfort of American Officials, the French



Scene from train to Kunming (September, 1940). A waterfall in Yunnan

very kindly placed a well-fitted private car at our disposal for the journey to Kunming. We thus set out from Hanoi in state on the last day of August. But we were destined to enjoy the private car for only one of the three days of travel required to reach Kunming. That first day we rolled through a tropical land, rather flat for the most part, filled with rice paddies as far as the eye could see. At nightfall we came to the Indo-China-Yunnan border, and the first overnight stop. Trains do not usually operate in Yunnan at night because of the danger from landslides. A small slide on the track might hurl a train from a cliff-side into a chasm some hundreds of feet below. Hence provision is made for overnight stops at the border and at Kaiyuan, Yunnan.

As we were leaving Hanoi we heard that the Chinese had placed some additional mines under the railroad bridge that spans the river marking the border between Indo-China and China, and that it was now no longer safe to send trains over that bridge. At Laokay, we found that the report was true. Only the day before, the Chinese

Military had prepared to blow up the bridge at a moment's notice, evidently anticipating that Japanese forces would soon enter Indo-China; and the French railroad officials declared the Chinese mines too dangerous to risk coaches on the bridge, even when pushed across without an engine. In consequence we lost one day at the border while we supervised the transfer of our accumulated baggage and effects from one side of the bridge to the other on the backs of coolies. After some hours our stuff was all reloaded again in a freight car on the Chinese side of the bridge, and we had only to wait for the train of the succeeding day to carry us on our way.

It was scarcely dawn on the morning of the 3rd day from Hanoi when we left our hotel, footed it across the mined bridge, and pushed into a crowded coach in the waiting train. To get into the coach at all required considerable pushing and persuasion on our part, plus the combined efforts of train crew and guards. In due course the train started and we began the long climb to the 6,000 feet altitude of the Kunming Plateau. We were scarcely 500 yards from the border bridge when we entered the first tunnel. We were to pass through some 150 more before reaching Kunming! Long stretches of the railroad are built along precipitous cliffs that look down on rushing torrents below. In those stretches, the railroad right-of-way is really but a series of tunnels and bridges. None of the tunnels are long but the train was too heavy, so we just

crept through some of the tunnels with the laboring engine spitting fire from its drivers as they spun on the slippery track. The coal burned in the engine was sulphurous and gave off an acrid smoke that frequently caused the baby to gasp and cry. We were rather concerned lest he suffer seriously from that smoke. I was then thankful that my new son, five months old at the time, was still basking in the sunshine of Peiping.

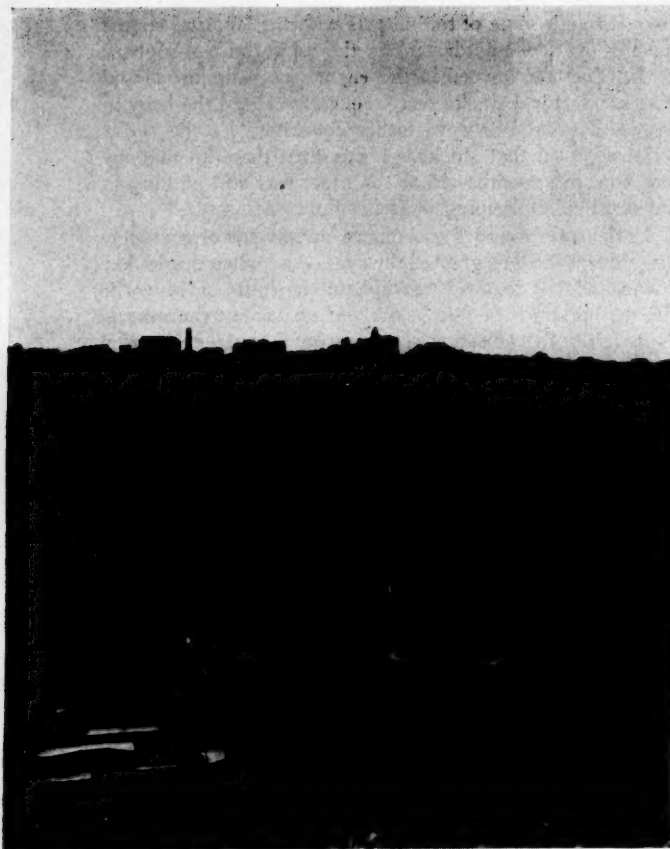
As the train rounded each curve a new view of genuinely magnificent scenery greeted the eye. And when one looked downward, the roadbed was hidden; he could only see the chasms hundreds of feet below. It was about the nearest approach to the sensation of flying that I have experienced outside an actual airplane. One small landslide, fallen to the track that morning, held us up for a couple of hours on that first day in Yunnan. That, and the slow progress of our train, left us, at the approach of darkness, still far from our stopping place for the night. By that time, however, we were over the more difficult climbs, and past the most majestic of the scenery, so we didn't mind going on several hours through the darkness to reach our stop at Kai Yuan. It was actually 1 a.m. instead of the scheduled 6 p.m. when we did reach the stopping place. And we were off again at dawn the next day. Our train was lighter now, and the climbs were not so steep, so we moved along at a good clip that put us into Kunming before dusk of the 4th day from Hanoi.

The city of Kunming (Yunnanfu on many maps) is built on level ground beside a pleasant lake. While it has a long history, including a visit by Marco Polo some 800 years ago, it only assumed importance during the current conflict. After the Japanese captured Canton two years ago, the Chinese had to use other routes of trade for importing their supplies. One route led through Indo-China to Kunming by rail, and another was established from Burma to Kunming by motor road. Thus, Kunming became one of the key cities of Free China. Although it is quite far south in latitude, its altitude of 6,000 feet gives it one of the most pleasant climates in China, neither hot in summer nor cold in winter. There are a few small factories, several large truck stations, and a military airfield in the vicinity of Kunming. All have recently become targets of Japanese bombers.

There is a truck road from Kunming to Chungking about 800 miles in length that usually requires a week of travel. But regular passenger busses have been discontinued because of a shortage of gasoline. The casual traveller has to negotiate his passage with some trucking concern, or wait his turn in a C.N.A.C. plane. I applied for a plane reservation as soon as I arrived in Kunming but had to wait two weeks before I could get a seat. Those weeks were not wasted, however, for I was able to improve them by visiting some of the personages of Yunnan and obtaining their views on the situation then prevailing in that corner of China and in the adjacent territory of Indo-China. And I must say that later events showed the Chinese to have been well informed. A few days after my arrival in Kunming, the Chinese destroyed that previously mined bridge at the border and began tearing up rails so the Japanese would never be able to use that line to support an attack into Yunnan from Indo-China. It was only a few days later that a French-Japanese agreement was announced which



USS "Tutuila" as seen from the Embassy



USS "Tutuila" and Chungking silently awaiting an air raid (River temporarily devoid of all traffic)

gave the Japanese the right to transport troops across Indo-China.

At the Kunming Airfield the Chinese maintained a Basic and Advanced Training School for student pilots. I visited the school a couple of times and talked at some length with the four or five American aviators who supervise the training. While training was hampered by a shortage of suitable training planes and an insufficient gasoline supply, there was still a good deal of activity at the field and I found it very interesting.

The day for my flight to Chungking finally arrived and I repaired to the airfield with suitcase, passport, and other required documents in hand. And it is amazing how many documents, and how much red-tape, one encounters when travelling in a country engaged in hostilities. For example, to obtain an airline ticket in China now one has not only to apply for the ticket, but also to apply for a Military Permit to make the flight, and submit two small photos with the latter application. Such measures are designed to hamper the activities of spies and are only a matter of form for accredited foreign officials, but they can still be quite a nuisance at times. Our plane, a Douglas DC-3, came in from Rangoon at noon. It was ready to leave again in a half-hour but a radio from Chungking reported an air raid in progress at that city. We then waited on the field at Kunming until the "All Clear" was sounded in Chungking.

That, however, involved a delay of only about an hour, then we were off for the Capital of Free China.

Though the motor road from Kunming to Chungking is nearly 800 miles long and requires at least six days of travel, the airline between the two cities is only 400 miles and requires but 2½ hours of travel! We had an uneventful flight in fair weather over country that was everywhere rough. To the northwest, in the direction of Tibet, purple mountain was piled on purple mountain until the peaks were lost in distant haze. But our route did not take us over any high peaks and it was only necessary to climb to 9,000 feet to clear everything between Kunming and Chungking.

An Embassy servant met me shortly after we landed and showed me the way to Ambassador Johnson's house, where I was to spend my first night in Chungking. I had met the Ambassador when he visited Peiping some months before. It was pleasant to renew the acquaintance so soon after landing in the strange and bomb-scarred city of Chungking. I also found an old friend at the Ambassador's in the person of the Assistant Military Attache, an officer that I had known quite well in Peiping prior to his transfer to Chungking a year and a half before.

Our Embassy, with its offices, the Ambassador's home, and the scattered accommodations of all the rest of the foreign staff of the Embassy are located on the south bank of the Yangtze River opposite the main city of Chungking. Known locally as the "South Bank," the area has long been the site of the major foreign establishment of Chungking, and the chief foreign residential area of the city. When they first began bombing Chungking, the Japanese announced that they would not bomb the South Bank, between certain limits, as long as that zone remained free of Chinese military establishments. Thus far they have respected that zone and only a few stray bombs have fallen within it. Consequently, the South Bank has become a haven of refuge, and a vantage point from which to watch bombings of Chungking. An excellent double-page picture that appeared in an August 1940 issue of *Life*, and showed bombs dropping in Chungking in great number, was taken from the immediate vicinity of our Embassy.

Chungking proper is built on a narrow tongue of land in the fork between the Kialing and Yangtze Rivers. The terrain is rugged, with steep hills and sheer cliffs rather numerous. At this point the Yangtze has a range of 100 feet between extreme high and extreme low water. Naturally, it is only high step banks that prevents the countryside's being inundated by the high water that comes with every Spring. The city is pretty badly scarred now with the ravages of fires and demolition bombs, but the Chinese manage surprisingly well in carrying on life and business in the parts that remain.

To cross the Yangtze from either side, one descends about 150 feet on uneven stone steps, boards a small steam ferry, and arrives a few minutes later on the foreshore of the opposite bank. Then he has to begin climbing, about 150 feet to the street level if on the city side, possibly 400 feet to the hilltop residence of a foreign friend, if on the South Bank. The series of steep hills on the South Bank on which the foreigners and wealthy Chinese have established their homes average about 300 feet above the river, and only a mile away there is another ridge of sharp peaks that

rises to 1,000 feet. Naturally, in such terrain there are no motor roads. To go from place to place one follows devious paths, for the most part paved with uneven stones and steps worn smooth by the padding feet of countless years. On the South Bank there are no wheeled vehicles, not even a wheel barrow. Pack horses are seen occasionally but, for the most part, everything that is moved is carried on the backs of men. Food, coal, building materials, all are laboriously carried from the waterfront to the heights by sweating coolies. Even though labor is comparatively cheap, it is inevitable, where so much human effort is involved, that transportation costs are high in this part of China. Most foreigners, and all Chinese who can afford to do so, employ four coolies whose sole duty is to carry the master about in a light chair rigged between two bamboo poles. It is a slow conveyance, but walking is exhausting for the fit, and impossible for the unfit. Fortunately, it is only the South Bank that presents such problems in transportation. The city itself is traversed by several motor roads and, once there, one can go from place to place with comparative ease.

Nor is the climate of Chungking one that I would boast about. In the winter it is foggy, rainy, and so overcast that one seldom sees the sun; in summer it is very hot and sticky. But in spite of its inconveniences, Chungking has its advantages at this time. Here, at least, we have a pretty good idea of what can happen at worst, which is more than can be said of most of the cities of the Far East.

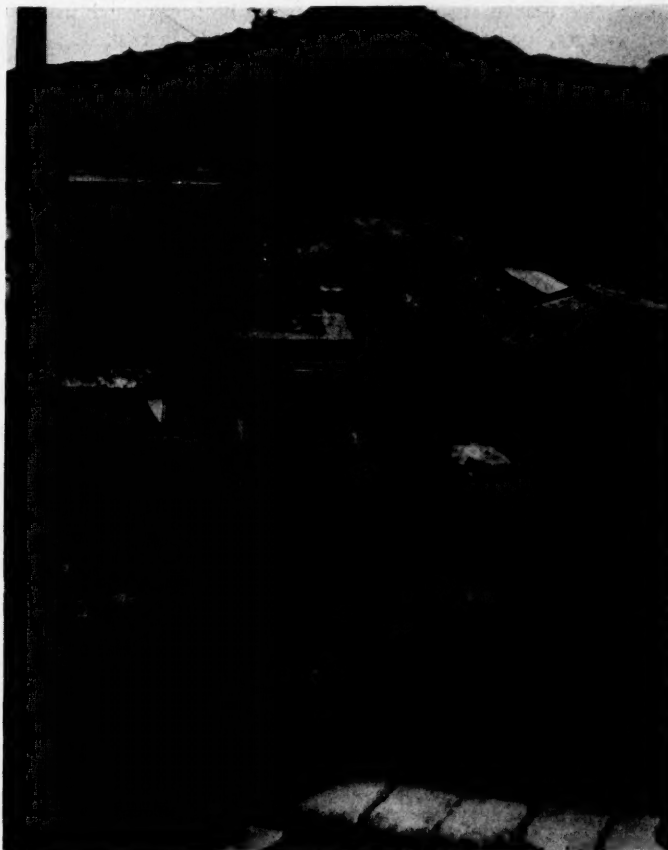
One of the advantages of Chungking is its system of air raid warnings. When Japanese planes enter the Province of Szechuan, outposts report them and a preliminary warning is hoisted in Chungking. Shopkeepers begin putting up their shutters and the populace moves toward the dugouts. During the past year the rocky slopes and cliffs of Chungking have been honeycombed with dugouts that can withstand the heaviest bombs. In consequence, the loss of life during the past summer's raids on the city was quite small. An hour or so after the preliminary warning, when the Japanese have passed outposts closer to the city, a second warning is hoisted, accompanied by the sounding of sirens. Another half hour and the Japanese will pass over a third line of outposts if they are actually coming to Chungking. This brings an "urgent" alarm on the sirens, and those who have been standing near the entrances of dugouts hasten to take cover, for bombs usually follow the "urgent" in a very few minutes. It is probable that no city currently undergoing bombardment has such long warnings, or such bombproof shelter for its inhabitants.

Chungking has been raided about fifty times since the beginning of hostilities, but only a half dozen of those raids have occurred since my arrival in mid-September. The Japanese usually confine their distant bombing operations to days when the weather is good at both the take-off point and the objective. In the Fall and Winter here there are not many days suitable for bombing. Of the raids I have seen, one was at sunset, all the others came at mid-day. Two on successive days in late October were rather memorable for me. During one of these raids bombs fell on three sides of the Embassy; namely, in mid-river opposite the Embassy and the USS *Tutuila* moored just offshore, on the near bank of the river three or four hundred yards down-river, and in rear of the Embassy a mile or so distant.

The bomb on the foreshore hurled a rock onto the deck of the *Tutuila* where it did some small damage, the several that fell in rear dropped in the open, but caused several casualties among poor Chinese who had sought shelter in the open ground of the South Bank. After that flight of planes had dropped its bombs and departed it seemed that the raid was over. Not waiting for the "All Clear," a few of us set out to examine the extent of the bomb craters, and the effects, of the bombs that had fallen in rear of the Embassy. But it soon developed that the bombings for that day were not yet over. While I was yet a short distance from the spot in a hillside where a couple of those bombs had fallen close together, another flight of planes made its appearance. At such times, the Chinese police require everyone to stand or lie still, so there was nothing for it but to drop down there in the open and wait for the raid to pass. On this occasion the planes dropped their bombs at a considerable distance but they circled overhead for a considerable and uncomfortable time; while I reflected that anti-aircraft shell splinters I have seen picked up on the Embassy grounds would make a nasty wound, to say nothing of the bombs themselves. After a few long minutes this flight also made off for its home field, and I continued on my way.

En route I had encountered several stretchers bearing wounded from the scene of the bombing. By the time I

(Continued on page 59)



South Bank, Chungking. 2 bombs just fell at arrow

MARINE CORPS RIFLE TESTS

SPRINGFIELD, GARAND, JOHNSON, WINCHESTER

How does a military organization go about selecting the right rifle for its fighting men? What should such tests demand of a rifle before it may be adopted? How thorough are they? Who conducts them? What is the procedure? Are the hardships of rough field usage simulated during the trials?

In the face of the universal interest aroused by Army adoption of the M-1 (Garand) in 1936, no questions could be of greater import to *Rifleman* readers. Here are the answers . . . the story of the gruelling trials at the San Diego base which led to the acceptance by the Marine Corps of the same rifle now used by our Army . . . the story of the Springfield, the Garand, the Johnson and the new Winchester, and how each of them reacted to the 37 competitive tests insisted upon by Marine ordnance experts before they would come to a final decision. This is the most complete account of these tests made public thus far.

(Courtesy of *The American Rifleman*)

ON the morning of November twelfth, 1940, a board of Marine Corps officers convened at the Marine Corps base, San Diego, California, "for the purpose of conducting competitive tests between such rifles as may be submitted to it." The directive provided that all weapons should be tested concurrently and subjected to as nearly identical treatment as possible. The tests were to extend over a period of not less than three, nor more than six weeks and were to be progressive in nature, increasing in severity from first to last.

The Board, as finally organized, consisted of Lieutenant Colonel William W. Ashurst, senior member, Lieutenant Colonel William B. Croka, Lieutenant Colonel Victor F. Bleasdale, Lieutenant Colonel Merritt A. Edson, Major Morris L. Shively, and Major Reginald H. Ridgley, Jr., as members.

A group of forty enlisted men was assembled as the operating and firing personnel. These men represented a cross-section of Marines who had at least six months' service and all of whom were qualified as sharpshooters or expert riflemen over the rifle marksmanship training courses in the Marine Corps. Their experience ranged from men who had fired the qualification course only once, to such well known team shooters as Sergeant Major Norman L. Tillman and Gunnery Sergeant Edward V. Seeser. The period from November 12th to 16th was utilized to instruct both officers and enlisted men in the nomenclature, stripping, assembling, care and cleaning, functioning and manipulation of each type of weapon.

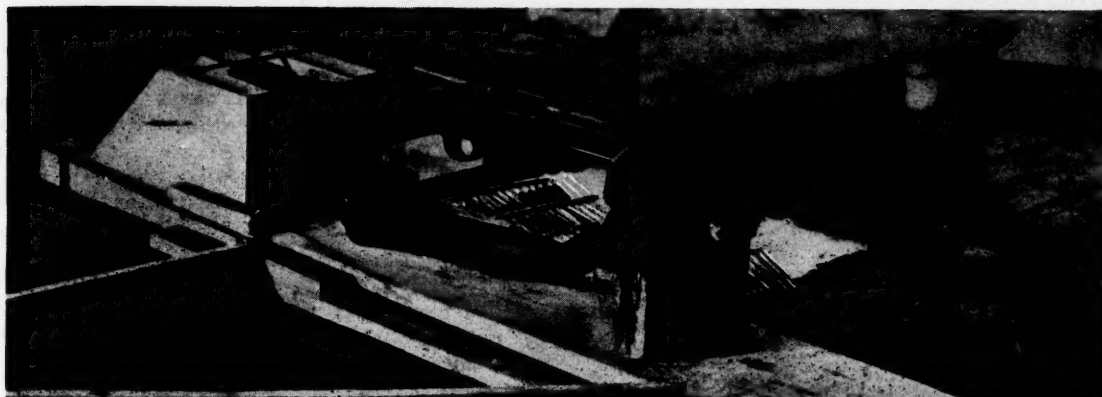
Twelve each of the M-1903 and M-1 rifles were selected at random for test. Code numbers were assigned. Because of the small number of Johnson and Winchester rifles available the Board designated at random before the actual test firing began, M-1903 rifles 11 and 12; M-1 rifles 15 and 16; the two Johnson rifles 25 and 26, and Winchester rifles 30 and 31 as the principal test weapons. M-1 rifles 13 and 14 and Winchester rifles 32 and 33 were later added to this number, although they did not participate in every abuse test.

The U. S. Rifle, caliber .30, M-1903 is the magazine-fed, bolt-action rifle commonly known as the Springfield,

with which everyone is familiar. The rifles submitted to the Board were from regular issue stock completely overhauled, rebarreled, and reconditioned by the Ordnance Section, Marine Corps Depot of Supplies, Philadelphia.



These are some of the Garands used during the tests. Similar improvised rests were employed in testing samples of all rifles considered by the Marine Corps.



Close-up of the rest employed, with a 1903 Springfield going through its paces

They were in all respects equal to the reconditioned rifles regularly issued to personnel of the Marine Corps.

The U. S. Rifle caliber .30 M-1 (Garand) is a gas operated, en bloc clip-fed, semi-automatic shoulder weapon. It was adopted as the standard rifle for the U. S. Army in 1936 and has been in production since that time. The M-1 rifles furnished to the Board were manufactured in June, 1940, and embodied all modifications in effect at that time. They were procured originally for use by the Marine Corps Rifle Team, 1940, and were similar to those issued to Service, National Guard, and Civilian teams at Camp Perry, Ohio, last summer. Barrels were of the latest one-piece design, instead of those with detachable gas-plug assembly manufactured prior to the Spring of 1940. None of these rifles had been fired.

The Johnson rifle is a recoil-operated, rotary-magazine fed, semi-automatic shoulder weapon. The magazine capacity is ten rounds, loaded with the standard five-round clip. This rifle was invented in March, 1936. The two rifles submitted to the Marine Corps Board were from a lot of seven manufactured in 1939 by the Taft-Pierce Manufacturing Company from production drawings. Prior to the Marine Corps test, these two rifles (Nos. 25 and 26) had fired approximately 10,000 and 15,000 rounds respectively. It is impossible to determine what effect, if any, this previous firing had in relation to the malfunctions which occurred in the Marine Corps tests.

The Winchester rifle is a gas-operated, magazine-fed, semi-automatic shoulder weapon. Magazines of five, ten, and twenty round capacity were submitted to the Board. These magazines are similar in design to that of the Browning Automatic Rifle, M-1918, and are held in the receiver by a magazine catch somewhat like that of the Browning. "The magazine may be loaded or partially loaded before being inserted in the piece (preferably using a modified B. A. R. loading accessory) or it may be loaded after being inserted in the receiver by forcing the cartridges in from the top of the receiver in the same manner the M-1903 rifle is loaded." Clip slots are provided in the receiver for this purpose. "This rifle closely resembles the M-1903 in general appearance, weight, balance, and ease of handling. It is of simple construction and has a relatively small number of major parts."

"The operating system is unique in that the gas is taken off six or seven inches from the breech, varying in different rifles, through a small port in the underside of the barrel. The gas escapes into a small chamber in the barrel lug, which houses a small, short piston. The expanding gases strike the piston head, driving it to the rear about one-tenth of an inch. At the end of its travel the piston seals the gas cylinder and prevents gas from escaping." Sufficient energy is imparted to the slide during this initial movement to force it to the rear, carrying with it the bolt-link and the bolt, which in turn extract and eject the empty cartridge case, and compress the driving spring which is housed in the butt stock. The action of the bolt-link locks the bolt in the receiver in the same manner as in the Browning Automatic Rifle. The trigger guard group carries the hammer and hammer spring. A bolt stop holds the bolt open when the last shot has been fired from the magazine, or it may be manually operated to hold the bolt open when the magazine is partially filled.

The Winchester rifle has been under development for approximately one year. Because it is comparatively unknown, it has been described in considerable detail, while it is assumed that *Rifleman* readers are familiar with the other three types of weapons tested. The four Winchester rifles submitted to the Board were toolroom models and each incorporated some variation in design from the other three.

The general characteristics of the four types of rifles considered are as follows:

	M-1903	M-1	Johnson	Winchester
Total number of parts	94	71	140	83, plus 4 in magazine
No. of parts handled in field stripping	11	12	13	11
Avg. weight w/o sling	8 lbs., 8.5 oz.	9 lbs., 9.7 oz.	9 lbs., 13 oz.	9 lbs., 3 oz.
Length overall (w/o bayonet)	43¼	43½	45¾	42¾
Length of bore	24	24	22	24*
Circumference, small of stock	5¼	5½	5½	6⅞
Trigger pull	4 lbs.	7 lbs.	6 lbs.	6½ to 19 lbs.

*One 22" barrel also submitted.

The actual tests began on the morning of November 18th and extended over a period of four full weeks. Dur-

ing this time approximately 12,000 rounds were fired through each of the principal test weapons, in thirty-seven separate tests, which are grouped in major phases described under the headings: Accuracy, Functioning and Miscellaneous Tests, Field Firing Under Fair to Ideal Conditions, Field Firing Under Adverse Conditions (Abuse Tests) and an Endurance and Fatigue Test. Numbers were assigned in chronological order to each test as it was fired.

On the first day a test was conducted "to demonstrate the action of the rifles, and to familiarize the assisting personnel and members of the Board with the mechanical operation of each rifle." One hundred and fifty rounds were fired through each weapon by enlisted personnel with members of the Board observing the action.

Following the completion of firing members of the Board fired each type of weapon to familiarize himself with their various characteristics, such as balance, trigger pull and recoil. The shots fired for this purpose, as well as all subsequent shots fired for demonstration purposes; for the purpose of equalizing the number of rounds fired through each rifle prior to beginning a new test; or for any purpose other than as a definite part of a prescribed scheduled test, were credited to Test I (a) in order "to maintain a functional record of all miscellaneous shots fired through each weapon." In the four-week test period, an average of 547 rounds was credited to each rifle in Test I (a).

ACCURACY

Three separate accuracy tests were fired. Test II was fired for score over the following course to demonstrate the effectiveness of the sights and "to compare the accuracy of the rifles when new."

Range(yds.)	Rate of Fire	No. of Shots	Time Limit	Target	Position
200	SF	10	1 min/shot	A	Standing
200	RF	16	60 sec.	A	Sitting from standing
300	RF	16	70 sec.	A	Prone from standing
600	SF	10	1 min/shot	B	Prone
1000	SF	20	1 min/shot	C	Prone
200	RF	16	60 sec.	D	Sitting from standing
300	RF	16	70 sec.	D	Prone from standing
500	RF	16	80 sec.	D	Prone

Four scores were fired at each stage, the firers rotating so that each man fired one score with each type of weapon. M-1 ammunition was fired at short and mid-ranges, and FA Palma Match (1937), at the long range. Average scores attained were as follows:

Type of Rifle	Slow Fire			RF-Target A		RF-Target D		Total Score
	200	600	1000	200	300	200	300	
M-1903	44.50	44.38	79.50	62.38	56.50	68.50	65.38	486.00
M-1	42.75	44.88	72.75	67.38	63.25	73.00	73.38	501.00
Johnson	41.50	38.88	71.50	64.50	61.88	72.63	73.00	485.13
Winchester	43.00	43.25	69.50	70.25	60.00	72.25	70.25	493.00

Approximately 2,650 rounds had been fired through each rifle prior to Test XXVI, which was to determine "the relative accuracy of the rifles after completion of

the field and abuse tests." Firing in this test was at 300 and 600 yards, using FA Palma (1934) ammunition. Four groups of ten shots were fired at each range, shooters again rotating so that every man fired one group with each type of rifle at both ranges. Shot groups were measured at the completion of the test and the relative "Figure of Merit" computed by adding the means of mean vertical deviation and the means of mean horizontal deviation and dividing by two. Results were as follows:

Type of Rifle	300 Yards			600 Yards			Final Figure of Merit
	MV	MH	FM	MV	MH	FM	
M-1903	5.35	4.21	4.78	14.7	7.3	11.0	7.89
M-1	4.28	4.76	4.52	12.4	9.3	10.85	7.685
Johnson	8.41	6.40	7.405	14.3	12.3	13.3	10.3525
Winchester	8.62	4.99	6.805	18.2	9.8	14.0	10.4025

The rifles were fired for accuracy again when 9,000 rounds had gone through them (Test XXXIV, in part). Procedure was similar to that for Test XXVI, except that the firing was at 200 yards only. Relative accuracy at this stage was as follows:

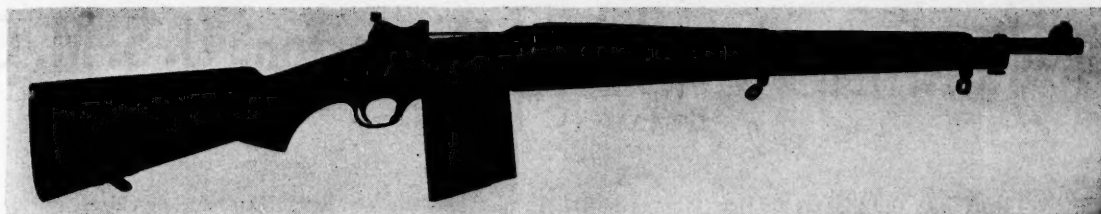
Type of Rifle	MV	MH	Figure of Merit
M-1903	6.39	4.09	5.24
M-1	9.54	11.03	10.28
Johnson	7.73	5.28	6.51
Winchester Code # 31	10.65	4.17	7.41
Winchester Code # 30	5.12	3.30	4.21**

**8000 rounds only. Not considered in the final standing of the accuracy test.

The results attained in these accuracy tests were undoubtedly affected by numerous factors other than the inherent accuracy of the barrels: weight and smoothness



The Johnson (left) and Garand rifles, which with the Winchester and Springfield made up the quartet of weapons tested at the Marine Corps Base, San Diego.



The Winchester semi-automatic, with ten-shot magazine in place. This is the first model, with solid handguard.

of the trigger pull; play of rear sight; fineness of adjustment of the rear sight in elevation and deflection. Although the M-1 appeared to be more accurate than the Johnson or the Winchester in the first two of these tests, the Board believed that "all three of the semi-automatic rifles are comparable to the M-1903 in accuracy."

FUNCTIONING AND MISCELLANEOUS TESTS

Fourteen tests were fired in this category, the results of which are briefly summarized as follows:

Test III—So far as could be determined, ordinary field stripping, cleaning and assembling does not noticeably affect the zero of any of the four rifles.

Test IV—Recruits who have had no previous experience with small arms can be taught the rudiments of nomenclature, stripping and assembling, care and cleaning and functioning of the semi-automatic rifles in about five hours, and that slightly less time is required for the M-1903 rifle.

Test V—All of the rifles are adapted to infantry drill, including the manual of arms, with slight modifications in the present regulations.

Test VI—Four scores were fired, the firers rotating so as to fire one score with each type of rifle, at 300 yards, prone, on the "A" target, "to determine the effective rate of fire at known distances and at fixed targets." Targets were exposed for two minutes for each score, equal consideration being given to the volume of fire and to the accuracy of fire.

Rifle	Shots per min.	Hits per min.	Score per min.
M-1903	14.25	13.81	61.87
M-1	22.31	22.06	99.50
Johnson	15.56	14.31	66.25
Winchester	12.38	12.38	54.62

Test XIV—The rifles functioned satisfactorily with all types of service ammunition: M-1 ball, M-2 ball, tracer, armour piercing, blank cartridges, and Palma Match, ex-

cept that none of the semi-automatics would function as self-loaders with blank cartridges.

Test XV—When held loosely in the hands without support, "the Winchester was the only semi-automatic rifle that would function normally. The M-1 rifle ejected the empty cartridge cases but habitually failed to feed. The Johnson rifles habitually failed to eject the empty cartridge cases. This does not mean that the semi-automatic rifles are unsuitable for assault fire as they will all function normally if held firmly at the hip (tight grip with both hands)."

Test XXII—Assuming that regular clipped ammunition has become exhausted in combat and only salvaged loose cartridges are available, loose rounds can be loaded and fired through the rifles in the following order of rapidity: Johnson, Winchester, M-1903 and M-1.

Test XXIV—All types of weapons tested are adaptable to bayonet fighting.

Test XXV—When firing "at plus angles of elevation, with bayonet attached, all weapons operated satisfactorily. At minus angles, each type of weapon had one or more malfunctions (failure to feed). The comparative ability of the semi-automatic weapons to function at minus angles with bayonet attached is as follows: M-1, Winchester, Johnson."

Test XXVII—The point of impact changed with all rifles when fired with bayonet attached, but the M-1903 rifle was the least affected and was the most uniform in distance and direction.

Test XXX—Two of the Winchester rifles submitted for test had chambers specially designed to facilitate extraction of the empty cartridge case. These rifles functioned in the normal manner even though the extractor was removed from the bolt. All rifles with conventional chambers failed to extract without the aid of an extractor unless the cartridges were well lubricated before loading.

Test XXXI—Parts of the M-1903, M-1, and Johnson

(Continued on page 54)



Winchester semi-automatic with five-shot magazine and improved cooling system. Note air-ports in the handguard.

Brigadier General Archibald Henderson, U. S. M. C.

BY JAMES C. JENKINS

LOOKING back into the history of that famous military organization, the United States Marine Corps, the outstanding part it has played in the establishment and defense of this great nation, its rôle in making possible the progress and development of our country, and its part in promoting the peace and security of our people and interests, wherever located, one must surely be impressed with its long and illustrious record of usefulness.

In reviewing the development and growth of the United States Marine Corps, its fighting spirit, its part in every major war in which this country has been engaged, its ability and readiness in meeting promptly and dealing effectively with each and every emergency for which called upon, regardless of whether the task was difficult or "impossible," any red-blooded American during the present unsettled and threatening state of world affairs must surely entertain a sense of pride, respect, and gratification for such an organization. Moreover, one must feel impelled to pause long enough to look into the cause, to seek somewhat for the inspiration and spirit that has actuated the Corps which, in the early days, often was termed "that gallant little band."

Of the many things that go to make up an efficient fighting force, all hands agree that the indispensable factor, leadership, always has been and always will be of prime importance. Readily apparent even to the casual reader of American military history is the fact that the Marine Corps has generally been blessed with good leaders, when leadership counted for the most.

The purpose of this narrative is to relate furthermore of the career of that outstanding leader, Brigadier General Archibald Henderson, "the grand old man of the Marine Corps," whose record of fifty-three years as an officer of the Corps, more than thirty-eight years of which he served as its Commandant, sets an all-time record for such tenure—a record in point of time and accomplishment that cannot be forgotten in American military annals.

Of Henderson's early life nothing is known. The records do show, however, that he was born near Dumfries, Fairfax County, Virginia, on January 21, 1783. That he was a person of education and refinement there is no gainsay. That he was exceptionally endowed with native ability and possessed the qualities and virtues of a soldier and leader is manifested by all reports, documents, the press, and his correspondence and relations with high officials of the government as well as with his officers and men.

Appointed a second lieutenant in the Marine Corps, June 4, 1806, may it here be said that Henderson arrived on the scene at an opportune time for gaining wide military executive and administrative experience. The young republic, having just emerged from the naval war with

France and the war with Tripoli that closely followed, was beset with grave difficulties. With the national treasury heavily drawn upon, if not depleted, in preparing for the national defense and in paying tributes to the various Barbary nations; with an army and navy comparatively small; with a marine corps termed as a "mere handful," America found herself threatened with still another and greater war, the War of 1812—when, incidentally, to show the spirit of the time, the old navy captains were given to nailing the colors to the ships' masts, and when the Marines with the aid of their trusty muskets, swords and cutlasses developed a decided taste in seeing that the colors remained thus fixed.

The gruelling sea-fights of the War of 1812 and preceding wars afforded a good test of both men and matériel. From such a setting our hero sprang.

Following his appointment as an officer in the Marine Corps, Lieutenant Henderson served on shore duty until the fall of 1807. In October of that year, after his promotion to the rank of first lieutenant on March 6, he experienced his first duty at sea on board the U.S.S. Sloop *Wasp*. Within a few weeks, however, he was assigned to duty on board the U. S. Frigate *Constitution* which had just returned to Boston from a long cruise in the Mediterranean. Soon after this the *Constitution* proceeded to New York, where she was dismantled and reconditioned for the arduous service that was soon to follow. After this first tour of duty on board the *Constitution*, Henderson appears to have returned to duty ashore. He was stationed at Charleston, S. C., and vicinity from February, 1809, to September, 1811. While on this assignment, in the summer of 1809, he commanded *Gunboats* Nos. 2, 3, and 9 at St. Mary's, Georgia. At those then remote posts and commands he was at times confronted with situations and conditions that called for independent action on his part, in the absence of orders from Headquarters, requiring judgment and resourcefulness.

The promotion to captain came on April 1, 1811. From September, 1811, to February, 1812, Captain Henderson was shown as commanding the Marine Guard on board the U. S. Frigate *President*. From September to November, 1812, he was stationed at Boston, Mass. Soon thereafter he returned to sea duty and took part in the famous engagement with the British ship *Java* (December 29, 1812). Not long after the outbreak of the War of 1812 he was again assigned to duty on board the U. S. Frigate *Constitution*, in which vessel he served during the remainder of the war.

As Captain in command of the Marine Guard of the *Constitution* he participated "in the glorious action" between that vessel and the British ships *Cyane* and *Levant* (February 20, 1815), which resulted in the capture of those

(Continued on page 50)

Guerrilla Warfare in China

BY CAPTAIN JAMES B. GRIFFITH, *U.S.M.C.*

TRANSLATOR'S NOTE

IN July, 1941, the undeclared war between China and Japan will enter its fifth year. One of the most significant features of the struggle has been the organization of the Chinese people for unlimited guerrilla warfare. The development of this warfare has followed the pattern laid out by Mao Tzu Tung and his collaborators in the pamphlet "Guerrilla Warfare" which was published in 1937 and has been widely distributed in "Free China" at ten cents a copy.

Mao Tzu Tung a member of the Chinese Communist party and former political commissar of the Fourth Red Army, is no novice in the art of war. Actual battle experience with both regular and guerrilla troops has qualified him as an expert. This I believe the biographical sketch extracted from Edgar Snow's "Red Star Over China" will indicate.

The influence of the ancient military philosopher Sun Tzu on Mao's military thought will be apparent to those who have read "The Book of War." Sun Tzu wrote that speed, surprise and deception were the primary essentials of the attack and his succinct advice "Sheng Tung, Chi, Hsi" (Distraction in the East, Strike in the West) is no less valid today that it was when he wrote it twenty-four hundred years ago. The tactics of Sun Tzu are in large measure the tactics of China's guerrillas today.

Mao says that unlimited guerrilla warfare with vast time and space factors establishes a new military process. This seems a true statement as there are no other historical examples of guerrilla hostilities as thoroughly organized from the military, political, and economic point of view as those in China. We in the Marine Corps have as yet encountered nothing but relatively primitive and strictly limited guerrilla war. Thus what Mao has written of this new type of guerrilla war may be of interest to us.

I have tried to present the author's ideas accurately, but as the Chinese language is not a particularly suitable medium for the expression of technical thought the translation of some of the modern idioms not yet to be found in available dictionaries is probably arguable. I can not vouch for the accuracy of the translated quotations. I have taken the liberty to delete from the translation matter which was purely repetitious.

MAO TZU TUNG

Mao Tzu Tung was born on a farm in Hunan Province in 1893. He began working in the fields at the age of six. From his eighth to thirteenth year he attended a local primary school during the day time and worked in the early mornings and at night on the farm. His father was a strict disciplinarian and Mao developed rebellious habits in his early youth. At the age of thirteen, in a fight with his

father Mao learned that, "When I defended my rights with open rebellion my father relented, but when I remained meek and submissive he only cursed and beat me the more." Shortly after this battle he gained his father's consent to return to school. This time he studied "Western Learning" including geography, natural sciences, and history.

In 1911 he served six months in the Revolutionary Army. The succeeding six years were spent in the provincial library of Hunan and at the Hunan Normal School. Mao became an ardent physical culturist and whenever opportunity afforded took long walking tours and hardened himself physically by swimming in the winter, sleeping in the snow, and walking in the rain.

It was while he was an assistant librarian at the Peiping National University that he became a convert to the Marxist philosophy, and from this time on he was constantly active in the Chinese Communist Party. In 1927 the split occurred between the Kuo Ming Tang led by Chiang Kai Shek and the Communist Party. From 1927 to 1928 Mao held together those elements of the army that were communist. During that year the army increased in size and in the autumn of 1928 was organized as the Fourth Army under the command of Chu Teh. Mao became political commissar. In the meantime a price had been put on his head by the Kuo Ming Tang, his properties confiscated, and his wife and younger sister arrested and executed.

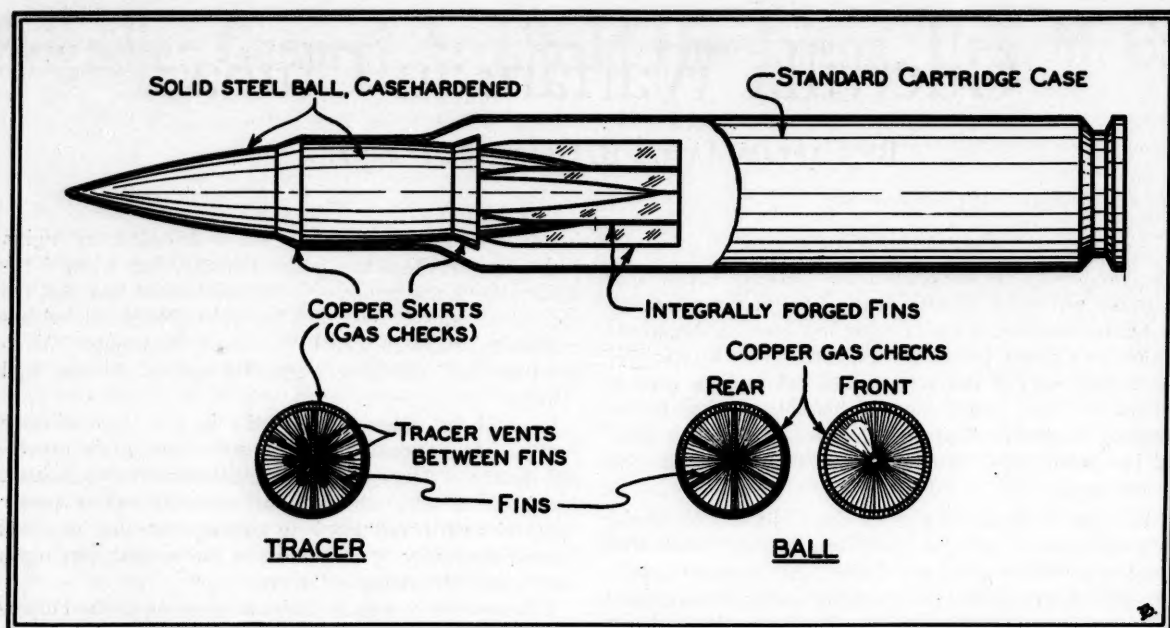
From 1931 to 1934 Chiang undertook the five extermination campaigns and in the latter year the Red Army was forced to move from south China to the northwest. This movement, now famous as the "Long March," terminated in Shensi in October, 1935. From the fall of 1935 to the spring of 1937 the Red Government led by Mao consolidated its position in the northwest.

PART ONE

WHAT IS GUERRILLA WARFARE?

In a war of revolutionary character guerrilla operations are a necessary part. This is particularly so in a war waged for the emancipation of a people who inhabit a vast nation. China is such a nation, a nation whose techniques are undeveloped and whose communications are poor. She finds herself confronted with a strong and victorious Japanese imperialism. Under these circumstances the development of the type of guerrilla warfare characterized by the quality of mass is both necessary and natural. This warfare must be developed to a degree unprecedented and it must coordinate with the operations of our regular armies. If we fail to do this we will find it difficult to defeat the enemy.

(Continued on page 40)



THE WINGED BULLET

BY SERGEANT TERRY BULL

Courtesy of Infantry Journal

AT Ease! Minsky, that means for you to put out that butt and pay attention to me. McCann, here's a stool up here.

Report!

Well, O'Rourke, will you interview Cohen and ask him is he going to stand this formation or would he prefer me to bring the platoon in there?

Now here is a sample of the new M-4 guns that're just coming out. Thank you, Gomez, and I'm glad you haven't forgotten your recruit training in nomenclature, but it's really *not* a rifle. It's a gun, a musket, or a piece, if you want to be technical. The Infantry's going smooth-bore.

You're right, Purdy, it *is* the M-3, with a new barrel—and as fast as they can put our small arms through the arsenals, they're going to replace all the barrels.

Machine guns, autorifles, everything that uses the thirty caliber ammunition is going through the mill—and coming out with nearly four times the punch.

Revolvers and pistols aren't important, of course, but I hear they're next—and as long as I do have to pack one of the damned things for inspectors, it'll be nice to know I *could* shoot through a Mungo helmet or a couple of steel shirts with it.

They're not rifling any more weapons, and any that come in for repairs are getting the new barrels for re-issue. Of course they've stopped making the old-type ammunition too.

What brought all this on was the Winged Bullet. Here it is—a case-hardened steel body, streamlined fore and aft, with six fins forged as part of the tail. The streamlined body cuts down the air res—the drag, and gives it more “staying power.” It'll hold its speed and trajectory longer than the flat-ended or boat-tailed bullet on that account.

Here, pass these samples back, Nussbaum, three to a squad. This bullet has it all over the old Spitzer type practically every way. It's probably the biggest improvement in firearms since my great-uncle Zeke almost won his war with a percussion-cap gun.

Notice the two copper bands around the belly of the ball. They're not bands, they're skirts—to keep the body lined up true in the bore and act as gas checks. The greater the force of the explosion, the tighter these skirts are jammed out against the walls of the barrel. The bullet rides on these soft copper skirts, and never comes in contact with the bore at all.

That's important. Maybe some of you birds have seen photographs of a rifle being fired—high-speed camera stuff, you know.

You remember how the first two or three pictures would have a puff of smoke getting bigger all the time in front of the muzzle? Then the next picture would show the tip of the bullet nosing out of the smoke. All the smoke you saw come out ahead of the bullet was wasted powder gas, leaking by the ball where the lands tore the jacket metal on account of the quick spin.

Start this picture around, Olsen. Now that page shows a few photographs of the M-4 being fired. When it gets to you, notice that there isn't a trace of gas coming out of the barrel in the first two pictures—in fact, there's nothing but the muzzle shown. The next shot shows the front half of the ball coming out of the barrel, and still no gas escaping. The last one shows the whole bullet, fins and all, jumping clear of the smoke cloud.

Yes, Lombardi?

The question is, if the rear skirt will hold back the gas that good, why have two skirts. There's a couple of reasons. If the bore gets pitted, some gas is going to shove by under the skirt when it's riding over the pit. If it does, there's nothing lost, because the second one catches it. Second, there has to be two skirts, so as to keep the steel ball from turning a little sideways and burring up the steel bore.

Now, what does this picture mean? It means that there's no powder gas leaking by the bullet—we use all of it to drive, and that gives us a lot more speed. Instead of around 2,700 feet a second, this bullet takes off at a little better than 5,000. That's partly on account of the gas seal, and partly on account of something else we'll come to later. And it holds its speed better, too.

Here's a funny thing—the bullet having those vanes on the tail, and being bigger than an M-3 from a side view, you'd think you'd have to take more windage on a breezy day. But remember that this bullet's twice as fast, so the wind plays with it only half as long, and you really don't have to take as much windage as you would with the M-3 bullet.

Another thing—this winged bullet's going to hold its line of flight nose-on, as long as it's in the air. You know how a hot or worn-out rifle or machine-gun barrel will throw a bullet sideways-to, sometimes even on the thousand-inch range. Well, a smoothbore can get worn out or expand with the heat to damned near a thirty-two, and the bullet'll never tumble. The skirts will expand to fill the bore, and that'll cause maybe a little more air resistance, so the ball may fall short, but it'll never key-hole.

One more thing about the bullet—there's only going to be two kinds from now on—armor-piercing and incendiary. The old lead-filled ball is *out*. I can't figure why that change wasn't made years back, just as soon as the Mungs started using body armor. Besides, why go through all the trouble to make a copper-nickel jacket and fill it with lead, when you can forge a thousand AP's with one pull of a lever, press on the copper skirts with another, and then drop 'em on a conveyor belt for a heat treatment. Of course they didn't use the gas-check idea in those days, and I guess they had to put on a jacket to save the rifling anyway.

Now for the gun. There's going to be no changes made except replacing the barrels and putting in new rear sights.

We have to have a new sight, because our trajectory is going to be flatter—and by the same token, instead of a 700-yard danger zone, our machine gunners can sweep a final protective line, say, 1,000 to 1,200 yards long on level ground, and never get their cone of fire higher than a Mung's brisket.

On account of the flatter trajectory, a mistake in the range won't be near so important, so even you people may be able to do some effective shooting when you're out on your own. Set your sights at 300, and you'll be able to cripple a Mung anywhere from 500 yards down to five feet.

There's no drift on the bullets, on account of there being no twist, so your new sights are not only going to be only half as tall—they'll run straight up and down.

By simply changing the barrel and sight, we can keep on using the same rifle—er, gun—cartridge case, primer, and loading machinery. That's important, with the factories as rushed as they are.

I heard the major telling the captain this morning about how they make these barrels. After they bore 'em out and chamber 'em, they start a polishing tool in at the breech. The carbor—the ab—the grit they use on the polisher gets worn out and thinner as it gets out toward the muzzle. Then they repeat a couple of times, starting with a finer grade of compound each time. That way, they take a pretty good cut out of the breech, but don't do much beyond polishing at the muzzle, so it leaves the barrel tapered just a gnat's hair from rear to front. Medium choke-bored to you shotgun men.

This choke-boring keeps a squeezing pressure on the copper gas checks, and prevents leakage, like I told you before.

Building smoothbores will be a whole lot faster than rifling. Have you got any idea how many operations it takes to put the rifling in an M-3 barrel? It's about—can't seem to remember now, but it's a slow job compared to straight boring—which may be why some of you recruits trained with the M-2, the M-1, the '03, and maybe even with the '17.

Taking care of these guns will be a recruit's dream. You know how metal fouling collects in the grooves of a rifled barrel. There isn't a decent rifle in the outfit right now! With the smoothbore, there'll just be a polished cylinder—nothing to scrape or catch metal. And with non-corrosive primers—

A gun like that is still going to be a good weapon even when it's practically worn thin, because it isn't the size of the bullet and barrel that matters any more—it's how far the gas-checks will expand that decides when the barrel has to be replaced.

But this gun ought to practically never wear out. The only friction the bore'll get is from the copper skirts on the bullet—the case-hardened body won't touch it at all.

I was just coming to that, Cohen.

Another angle on why this bullet takes off so fast is that the bore isn't rifled. I'd never thought of it before, but the old—the captain said this morning that it takes a lot of force to start the bullet spinning as fast as it does, and that the riflings must hold the bullet back a lot by dragging and tearing into the jacket. So between the gas seal, the lack of twist, and the smooth surface—no wonder the thing turns up around 5,000 feet a second. We get speed instead of spin.

By doubling the speed, we build up the smashing power away out of proportion—around four times as

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KEEP THEM FIRING

A Study of Malfunctions and Stoppages

BY CAPTAIN MELVIN MAYNARD JOHNSON, JR., U. S. Marine Corps Reserve

INTRODUCTION

THIS article is prepared in the hope that it will be of some aid to that harassed, mud-encrusted, much-exhorted, little-appreciated, generally exhausted individual who actually pulls the trigger, as well as to his equally harassed and over-worked squad and section leader, platoon and company commander.

If perchance any hard-hearted bearers of gold-braid and rank should cast their logistical-data-scarred eyes upon this humble page, it is hoped that they will reflect upon wisdom of worthy Chinese philosopher, Confucius, who say:

"One loud bang worth thousand lousy duds."

Which, in modern language means that all the weapons and ammunition in the world are of no use in combat if you cannot "keep them firing."

DEFINITIONS

Unfortunately, there exists great confusion and misunderstanding over the following terms:

Stoppage
Malfunction
Functional failure
Jam

A *stoppage* is an accidental cessation of fire for any reason. It may be caused by defective ammunition, a defect in the magazine or feed mechanism, a defect in the gun itself, careless or improper loading of belt or magazine, dirt in the mechanism, or by the fault of the operator.

A *malfunction* is a failure of a *designated* element to operate or perform in a proper or normal manner.

In other words there is really no such thing as a plain "malfunction." A *stoppage* may be the result of a malfunction of the ammunition, or a malfunction of the gun mechanism, or of the feed system.

For example, if a cartridge misfires during the process of firing, that constitutes a *stoppage*. It may be due to a malfunction of the ammunition (primer defective), or due to a malfunction of the gun (weak hammer or striker spring, defective or broken firing pin, excess headspace). But this misfire may be due to the fault of the operator in failing to manipulate the gun correctly, or, in the case of a new gun, failing to clean off the grease or cosmoline from the striker.

A *malfunction* generally results in a *stoppage*. However, the slide on an automatic pistol might fail to remain open after the last shot, due to a malfunction of the catch, yet this need not cause a *stoppage*.

The use of the term "malfunction" conveys nothing unless we know *what* malfunctioned.

The following illustration is submitted to emphasize the

point that malfunctions must be described by reference to the defective element, and evaluated.

Gun A100 fired 1,000 rounds and had 10 "malfunctions."

Gun B200 fired 1,000 rounds and had 200 "malfunctions."

Which gun would you choose, as between the two?

First, you must analyze the malfunctions of Gun A100:

Total rounds fired	1,000
Malfunctions of ammunition	None
Failures to feed	None
Explosion of breech, resulting in serious injury to operator, due to defective design of breech-locking mechanism, and requiring replacement of receivers (5), bolts (5), extractors (4), barrel (1), stocks (3), magazine assemblies (2)	5
Failures to extract due to broken extractors	5
Total	10

Gun B200 malfunctioned for the following reason:

Total rounds fired	1,000
Failures to feed due to defective magazine spring found to have been improperly heat-treated and having insufficient tension to lift more than 50% of the capacity of the magazine	200
Other failures of any part of the mechanism to operate	None

Note: Spring was replaced after 400 rounds and the last 600 rounds were fired without any stoppages or malfunctions whatever.

Technically, gun B200 should have been examined after the first twenty rounds, the defective spring should have been discovered, replaced, and the test *then* continued. Therefore, the report should have read:

Defective magazine spring, replaced after 20th round	1
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A *functional failure* is a failure of the operating mechanism to function normally due to a fault of the mechanism.

For example, a feed failure due to the magazine in a weapon having a spring-actuated feed system, is not a functional failure. A failure to extract due to a defectively-designed extractor would be a functional failure, as would a failure to eject due to lack of sufficient operating power in the mechanism of an automatic weapon.

A *jam* is a colloquial expression meaning a *stoppage*. The writer once explained an automatic weapon to a group of British soldiers, and was asked by an inquiring recipient of His Majesty's shilling:

"'Ow many bleedin' *jems* do yer 'ave?'"

Probably the term *jam* is used because of the comparative frequency of actual jams in the magazine of several types of well-known rifles and light machine guns.

TYPES OF STOPPAGES

It is of course impossible to cover *all* possible stoppages and malfunctions, their causes and remedies, because each weapon has its own peculiar characteristics, and reference must be made to the instructions furnished with the weapon issued.

Moreover, because of their peculiar design, some weapons are more likely to develop certain types of stoppages than others.

For example, failures to extract the empty shell from the chamber due to a broken extractor are quite possible in the M1918 Browning Automatic Rifle, but almost impossible in the M1917 Browning Machine Gun, for the latter has a T-slot in the face of the breech-block which engages the extracting groove in the shell, instead of a conventional extractor as in the B.A.R.

Again, the B.A.R. may have stoppages resulting from excess fouling in the gas cylinder and on the gas piston, whereas the B.M.G. has no gas cylinder or piston. Instead, the barrel of the B.M.G. may fail to recoil due to a tight muzzle gland.

Consequently, we shall not attempt to describe each specific gun, but instead will use common types of parts such as barrels, bolts (this means breech-blocks), extractors, ejectors, magazine feeds, firing pins, hammers, etc.

Accordingly, the most common kinds of stoppages in rifles, semi-automatic rifles, automatic (or machine) rifles, light and heavy machine guns, pistols, sub-machine pistols, sub-machine guns are as follows:

Type I: Failure to fire or misfire.

Type II: Failure to unlock the breech.

Type III: Failure to extract the empty case—*primary* (this means failure to loosen case from chamber).

Type IV: Failure of the breech to open or failure of secondary extraction, or failure to pull shell out of chamber. (Type IV B: In belt-fed weapons, failure to extract cartridge from belt.)

Type V: Failure to eject the empty case.

Type VI: Failure to engage the head of the cartridge in re-loading.

Type VII: Failure to load the cartridge into the chamber.

Type VIII: Failure of the breech to close fully, or failure to lock.

ANALYSIS AND FIELD REMEDY

It is not intended here to do more than indicate what might be done by the operator or gun crew to make the best of a bad situation.

Unless reference is made specifically, this analysis and list of remedies covers military repeating and automatic weapons. Tabulations are avoided as far as possible because the table system is too far from being readable.

So here we are in a mud-hole, aching in every joint, dog-tired, and hungry, but battle-mad. The enemy is coming on relentlessly. We cannot afford to be out of action more than a few minutes. We must "keep them firing."

Alas, we press the trigger in vain. Misfire!

Question: *How could we have guarded against these stoppages before we reached the combat zone, and what can we do now that we have them?*

TYPE I

Failure to fire, or misfire

1. *Cause:* Bad primer in cartridge.

Remedy: Wait about ten seconds for a hangfire, but not too long if the chamber is hot from firing. Yank it out and fire the next cartridge. Or, if you insist, cock and try again. If the next few rounds also misfire you probably cannot blame the ammunition, so—

2. *Cause:* Weak hammer spring, or weak striker spring or equivalent.

Remedy: You could have checked this before. Watch your empty cases in practice firing, and note whether your gun or guns are delivering healthy blows to the primers. But here you are, and the best you can do is to procure another spring, or clean and oil the ignition parts to *reduce the friction as much as possible*. Maybe it is a borderline case, and every little bit will help.

3. *Cause:* Perhaps the trouble is with the firing pin which may be worn, broken, or jammed due to dirt, fouling, or may be sluggish in cold climates due to gummy oil.

Remedy: Replace the pin, or clean the affected parts. Again, you could have corrected this difficulty in practice firing. Watch your firing pins and the primers in your empty cases. A bad pin discloses itself in the fired primers. **DO NOT OIL A GUN IN COLD CLIMATE.**

4. *Cause:* Not infrequently misfires result from either too much headspace or not enough headspace. This is especially likely in such weapons as the Browning

Remedy: Letter of complaint, etc. machine gun (M1917—"heavy Browning"), in which the headspace is adjusted when the barrel is assembled.

Reason: The significance of headspace is often misunderstood.

For a complete explanation of headspace refer to the section entitled "Headspace" at the end of this article. In this connection it may be stated that if the headspace is insufficient to permit the bolt to lock the cartridge in the chamber, the gun can not fire. If the headspace is excessive, the firing pin can not reach the primer of the cartridge in most guns.

Remedy: Refer to instructions pertaining to your gun and, if possible, adjust the headspace. You could have checked this before moving up. If the headspace can only be adjusted at the factory, content yourself by writing a nice juicy letter of complaint which the stretcher bearers may find amongst your personal effects. But, nevertheless, you could have discovered the trouble in practice firing and turned over the gun to the armorer. That's what he's there for. You must be expected to know enough to see that something is wrong with the functioning on the range.

5. *Cause:* The trigger may be jammed, bent or broken. The sear may be jammed, bent or broken. The sear spring or its equivalent may be broken or defective.

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TANKS AND TERRAIN

FIRST LIEUTENANT ROBERT A. MCGILL, *U. S. Marines*

PSUEDO-MILITARY experts to the contrary, there are absolutely no reasons for scrapping all the military strategy and tactics that we have learned in the past twenty years. True, new events have taught us much; however there are no changes in the principles involved of war—only their application has changed. Invaluable information has been gained through the success or failure of highly touted machines of war. Heavier armament for aircraft, improved AA protection for surface vessels, armored gas tanks and cockpits for aircraft, more mobile and powerful anti-tank weapons, and more durable construction for tanks and vehicles are a few of the innovations dictated by events on the European proving ground.

Outwardly, war remains strategically and tactically the same, but in each succeeding conflict the pace is faster. The fight of weapon and counter weapon is always present.

Let us on available information endeavor to analyze the German invasion of the low countries with the subsequent fall of France, the attempted invasion of Greece by the Italians, and the British desert campaign, in which for the most part we will treat them as terrain problems in relation to motorized units. It will be seen how a full appreciation of the terrain by those in command of the victorious forces contributed immeasurably to the success of the ventures, and how disregard for the terrain resulted in disaster. We will endeavor to use these lessons in developing a landing force whose forward assault units are motorized.

THE GERMAN INVASION

The French fully expected an attack by the Germans along the Maginot Line, and were so obsessed with the idea that all maneuvers stressed primarily the fighting of a defensive war. The French are reputed to have given artillery the primary role in a war, subjugating infantry to a secondary one. Not necessarily a role of impassivity in the case of infantry, but the prime consideration in a war of position was whether or not the artillery was placed to the best advantage, even better tactically than the infantry. This at the outset would seem to make an army less mobile, and less ready to meet a rapidly changing condition. The above is not to be construed as the author's conception that the relative importance of artillery has decreased through the years. Artillery will always remain an important auxiliary to the infantry, *but it will always be an auxiliary.*

During the eight months of quiet after war had been declared the Germans intensified the French belief that an attack would be launched frontally along the Maginot Line by using small widely dispersed skirmishes which appeared to be a feeling out of the French defense system.

It is doubtful if Germany had ever intended storming the Maginot Line with its attendant great losses of men and material. Unreasonably, the English and French did not believe that the lowland countries of Holland and Belgium would be molested or invaded. Choosing the time,

place, and method of attack was a German prerogative. A quick sharp thrust through the relatively undefended lowlands was considered the best method. Speed was best accomplished by the use of tanks and vehicled infantry. The flat terrain, with its numerous bridges and its excellent road net, was perfectly situated for such an attack. Dry months were chosen, as the Germans fully remembered the Italian debacle in the Spanish Civil War at Guadalajara when an Italian column was bombed off the road and was unable to flee due to the wet, soggy condition of the surrounding country.

When the attack was launched the amazing speed with which advance units covered the ground surprised all. It was inconceivable that hostile units could cover thirty miles per day. However, although the greatest coordination was necessary, the underlying tactics were simple.

First, air superiority was obtained. The results were didactic. The French had no observation to their front, and rear areas and troop concentrations could be bombed at will. Text books often speak of air superiority, but here certainly the full import of the term was brought home forcibly.

Secondly, there were concentrated attacks by rapidly moving armored divisions along the entire front under attack, which crushed strong points, disorganized troops and communications, and penetrated far into the lines, creating deep salients.

Thirdly, all the ground gained through armored attack was held and mopped up by infantry, who were transported by the most rapid means available, including truck, bicycle and combat car.

Not enough can be said about the four sections of the German army staff which from results must have accomplished wonders in rapidly transporting to the front needed supplies of gasoline, repair crews and reserve tanks. Probably much fuel and food was obtained from the invaded countries from day to day.

If the terrain at certain points was found to be unsuitable for tanks, rather than have the attack bog down and stop, the armored vehicles were instructed to detour around the hostile strong points. The closely supporting infantry with dive bombers and artillery support would quickly neutralize such defense positions, destroying them. The importance of close infantry support can not be too greatly stressed. It will be remembered that in World War I the British launched the first tank attack as a complete surprise to the Germans. Unfortunately, there was no supporting infantry, and the gains of the tanks which penetrated far into the German held ground were quickly lost when the tanks stopped due to lack of fuel and night-fall. There was not sufficient personnel at hand to organize the ground gained, and the following day the Germans regained the land by destroying the helpless tanks. It is axiomatic that a tank's offensive power ceases when it can no longer move.

Here then in this particular campaign was a perfect military operation, faultlessly executed.

THE ITALIAN CAMPAIGN

When the Italians marched on Greece similar tactics were attempted without visible success. Combat cars and tanks were limited to the narrow mountain roads in the Pindus Mountains. As the Greeks had strong defensive positions in the mountain heights, it was impossible for the Italians to protect the flanks of their armored columns. Such columns were brought under the fire of mountain batteries, and due to the fact that they were limited to the use of particular roads, were easily destroyed by mines and tank traps. The superior aircraft of the RAF gave timely assistance to the Greek forces, giving them control of the air with attendant advantages.

The fatal error in this campaign was a total lack of appreciation for the terrain problem involved. As a matter of fact, the approaches to Greece from the Adriatic sea and Albania, and the natural barrier formed by the Pindus Mountains, make an attack impractical even for a first class power. Weather, a doubtful ally for either force, worked to the disadvantage of the attacker. See figure 1.

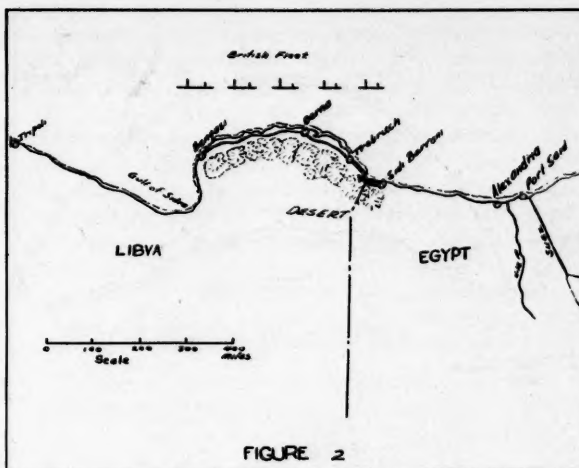


THE DESERT WAR

A campaign as equally brilliant as that of the Germans in France and the low countries has now been completed by the British forces in Libya in northern Africa.

As is known, the significance of an attack on Egypt by the Italians was due for the most part to the Axis' desire to control Port Said and the entrance to the Suez Canal.

Although the numerical superiority of the Italians to



the British was almost 2 to 1, it can be seen from figure 2 that the Italians were extended over a front of three hundred and fifty miles. The fortifications at Bengasi, Derna, Trobruch, and Sidi Barani were not built as a continuous line of defense along the whole area, but rather as defenses where it was thought the British might attempt landings from the Mediterranean. Connecting the above forts was an excellent highway, which, when the British attack started rolling, was ideal for assisting them in keeping their lines of communication intact. To properly garrison all of the fortified position no great number of troops from the number available could be concentrated at one point. To the rear of the position was the high plateau of the Libian desert, and to the front was the British fleet in command of the Mediterranean.

The British force at the point which the battle began was larger than the force the Italians had at that time at Sidi Barrani, although the total Italian forces present in Libya outnumbered the British as has been said.

The British appear to have had control of the air, and most definitely had control of the sea, preventing any influx of supplies and reinforcements. Considering the fleet as a holding attack, what the land forces actually did was roll up the Italian flank.

The flat terrain in the sector was ideal for motorized assault, and of this the British took full advantage. Supposedly their equipment was superior. Catching the Italians totally unaware was a helpful factor. Many have said that they do not understand how the Italians, as they were pushed back, gradually getting more and more troops which were falling back from the front, did not consolidate a new position and counter attack. The explanation is simple:

The situation was a rapidly moving one. There is no chance in this type of warfare to organize an orderly retirement. The mechanized forces are upon the defending infantry so fast that the soldier can not retire but must run in disorder or surrender. The speed with which events took place can be realized when it is remembered that thirteen general officers were captured in eight weeks. As there was not retirement but a rout, evidenced by the multitudes of prisoners, the force did not get stronger, but weaker. The British captured practically all the enemy

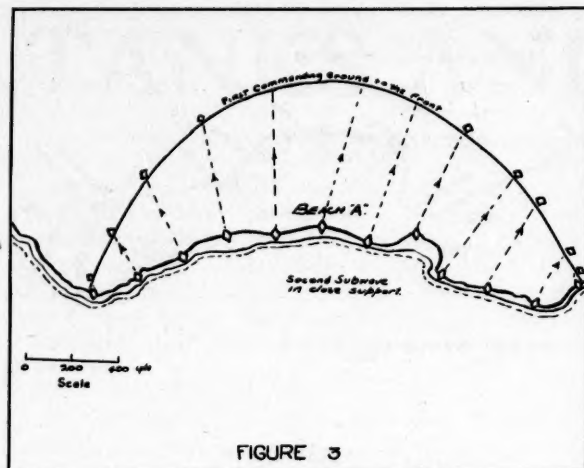


FIGURE 3

troops as they passed through successive defensive positions. As the attack gathered momentum, the pursuing forces on being held up at Trobruch did not stop the whole attack. A besieging infantry and artillery force was left at this fortress while the mechanized forces pushed on around the strong point. Fortunately for the British, the nature of the terrain acted as protection for their flanks. The desert was on their left and there was no threat of attack from seaward.

This successful operation should not be left without something being said about the decentralization of command. It would appear that the British forces were told what to do, and given a general plan. It is believed that much was left to the initiative of the lower commanders. Too often orders from higher authority are too complete, tending to disrupt an operation if some unforeseen incident takes place. Much credit must be given to junior officers in command of the motorized forward combat units for their continuous harassing of the enemy flanks. As one officer has said, they might be termed "1941 Jeb Stuarts."

OUR LANDING FORCE

From the above three campaigns we should gain much which will develop new organization in the operation of a landing force.

First let us consider the necessity for strong air support. There should be made available to a landing force enough aviation to give observation of the enemy, enough fighter or attack planes to actually neutralize the beach defenses, and enough bombing aviation to hit rear areas and lines of communications. Besides this there must be enough additional craft to give complete control of the air to the attacker. In no military function is aviation as integral a part of the operation as in a landing on a well defended beach. Without a preponderant superiority in air force, the success of the evolution is prejudiced. Nothing is as helpless as infantry in a ship to shore movement. At no time is the force as vulnerable to annihilation. Naval gunfire support is only a partial answer, as it must be lifted long before the boats reach the beach. This is not so with aircraft support.

TANKS AND ARMORED VEHICLES IN A LANDING OPERATION

The advisability of using tanks in forward assault units for landing operations should be thoroughly investigated. With the proper terrain, which primarily means sloping beaches, and ground leading from the beach which will not prohibit the free movement of tanks and other vehicles, tanks could be used to a great advantage. With an amphibious tank sloping beaches would not be necessary. In all landings the author has observed those beaches on which infantry landed would have served equally well for heavy vehicles. Not only would their use do much to lessen the great initial losses sustained by the leading subwaves of infantry on landing from machine gun fire, but they would also afford a rapid method for movement inland and the subsequent destruction of beach defense guns.

A tank peculiar to the needs of the Marine Corps should be developed including features especially adapted to amphibious work. Such designs are available. It is fully realized that many objections can be raised including those of material needed, and the amount of lighters and accompanying equipment necessary. However, none of these prohibit the feasibility of the project.

Any landing operation against a well defended shore establishment should be performed with intense effort, and no commanding officer should have to shrug his shoulders and remark that he would use what he had to the best advantage. If he needs a thousand planes and a thousand tanks, and fifty transports, and ten aircraft carriers, he should have them for an all-out effort.

Let us assume a landing on the following hypothesis: See figure three.

Beach "A" as shown in the figure is one of the beaches on which a landing is to be made on a hostile shore. This beach is hydrographically suited for the use of tanks and combat cars. It is the average beach usually chosen for infantry. The surf is not too strong to prevent the landing of troops, and there are no steep cliffs adjacent to the beach.

Air superiority is obtained, and is that type of superiority which means *complete and absolute control of the air*.

Tank lighters move to the beach from the initial point in sufficient number to cover the total beach line. During this movement lighters are protected by naval gunfire support, fighter and attack aircraft, and such of the tanks' own guns they can bring to bear.

On landing, tanks move rapidly inland with a primary mission of forming a beach head line. A secondary mission is that of destroying such beach guns and strong points as are in their direction of movement. The first subwave is closely followed (not more than "H" plus five minutes) by a second subwave of combat cars or foot infantry whose mission is to mop up and fill gaps in the line. As the movement continues inland, succeeding subwaves of tanks and infantry are landed. These units are obviously for the replacement of casualties, and for the filling of gaps in the line that will exist as the units move inland.

Beach installations are not completed until the tanks and motorized or foot infantry have overcome the main resistance adjacent to the beach concerned. During these initial developments much of the operation of the forward

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ADVANCING SPRING ROAD WORK WITH ALL-WHEEL- DRIVE

"Owners of Marmon-Herrington All-Wheel-Drive Converted Fords, who have purchased these vehicles largely on account of their superior performance in snow-removal, have another decided advantage in the use of these trucks for spring road conditioning," says a bulletin to dealers just issued by the Marmon-Herrington Company.

"Due to the increased traction, gained through power applied to all wheels, Marmon-Herrington All-Wheel-Drive Converted Fords can be put to work earlier in the Spring on gravel roads. Equipped with under-body scrapers or with pull-type maintainers, they can be pressed into service while the roads are still soft, which is the ideal time to cut off the 'washboard' ridges and to shape up the road. One good scraping early in the Spring is more effective than several workings after the road bed has become hard and dry.

"And then, after the grading is done, the blade or pull-scraper can be removed and the same truck can be utilized for replacing gravel that has been washed or worn from the road bed—getting in and out of gravel pits and through 'tough' going where no conventional drive truck could operate.

"Snow-removal, in most sections has ceased to be a problem for this year," the bulletin continues, "but we should not let Marmon-Herrington owners get the idea that these trucks are 'one-purpose' jobs to be put away in moth balls until the snow flies again next Fall. The same superior traction that is so valuable in clearing roads of ice and snow, is equally valuable in year around road main-

tenance."

As most of our readers are aware, the Marmon-Herrington Company converts all standard Ford trucks, commercial cars and passenger car models to All-Wheel-Drive. This work is done in the Marmon-Herrington plant at Indianapolis, Indiana, where a complete line of "heavy-duty" All-Wheel-Drive trucks is built. These vehicles incorporate many exclusive features of design and construction, and are known all over the world for their superior performance and dependability under difficult operating conditions.

PROGRESS IN COMMUNITIES

The use of modern roadbuilding and construction machinery in the development and progress of states, counties, cities and towns, is described in a 20-page booklet that has just been issued by Caterpillar Tractor Co.

"Nations, cities and towns must either go forward or drift backward—they can't stand still. And progressive communities know that movement is not optional—they must go forward," the booklet says. With photographs and operating records, it points out that governmental bodies have found that progress and economy can go hand in hand.

Motor graders, tractors and Diesel engines are illustrated on a wide variety of jobs from snow removal to municipal generating plants. The ability of a single modern construction machine to economically perform a quantity of tasks is also illustrated.

Copies of the booklet may be obtained by writing Caterpillar Tractor Co., Peoria, Illinois, and requesting Form 6531.

Thompson Submachine Gun



SPECIFICATIONS of Model 28-AC

Calibre .45. Weight 9 lbs., 13 oz. Length 33 in. Length of barrel with Compensator 12½ in.; without Compensator, 10½ in. Equipped with Lyman sights and wind gauge; 20 and 50 cartridge capacity magazines. Ammunition, calibre .45 Colt Automatic Pistol Ball Cartridges (230-grain bullet). Cuts Compensator (attached to muzzle of gun shown) increases rapidity and accuracy of semi-automatic fire, lessens tendency of muzzle rising in full automatic firing and reduces recoil to practically nothing.



A rapid, short range weapon free from stoppage due to overheating. Light in weight and extremely flexible in fire control and direction.

For every purpose where a maximum fire power, at short ranges, and even mid-ranges, is required from a minimum number of men. Delivers a devastating fire at the ranges where hits are mostly made. Gains and holds fire superiority at ranges where its loss would be disastrous.

AUTO-ORDNANCE CORPORATION,

BRIDGEPORT, CONN.

A Critical Analysis of the British Operation in German East Africa During the World War

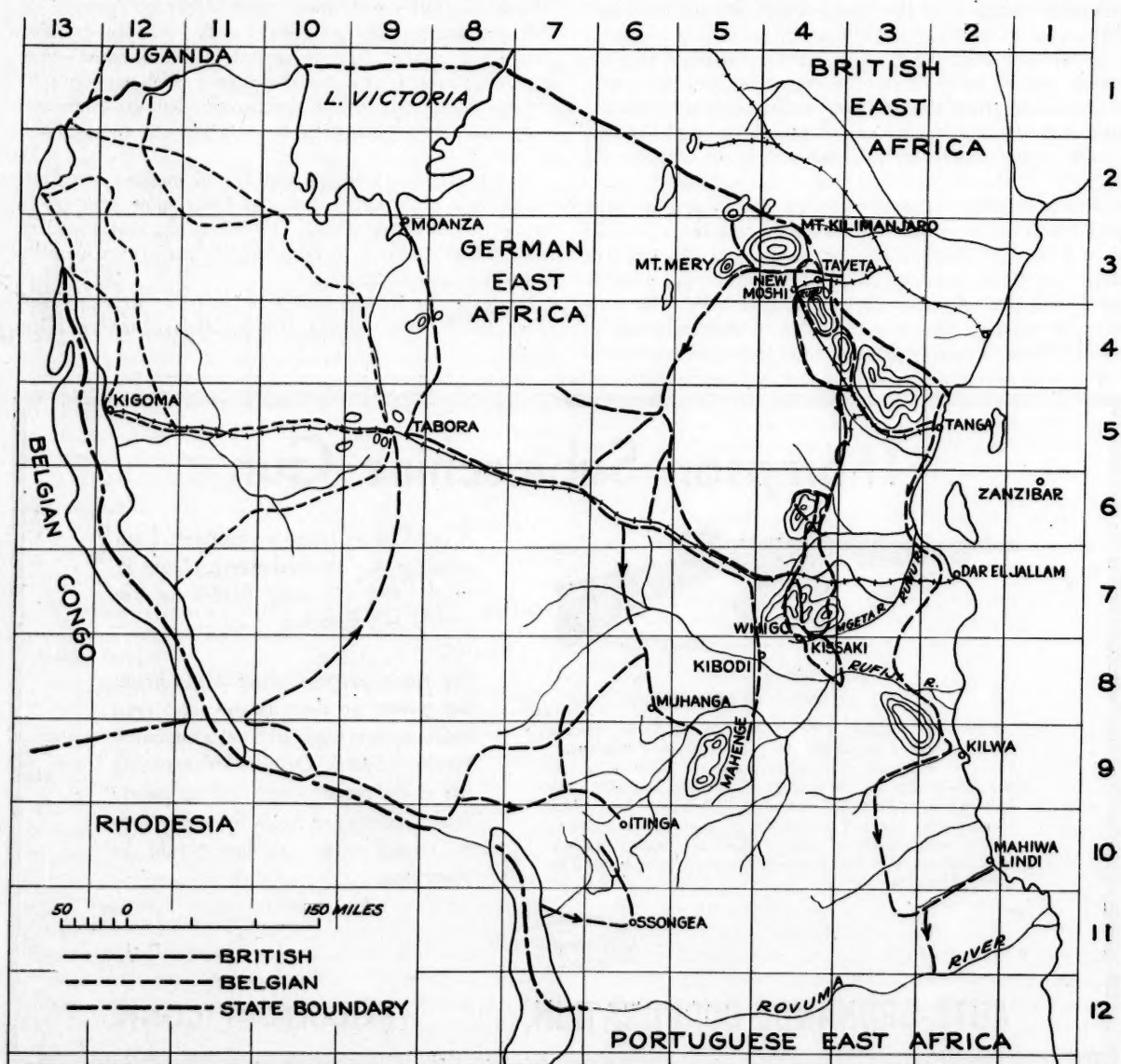
BY CAPTAIN ROBERT O. BOWEN, U.S.M.C.

GERMAN East Africa "where military operations were conducted under tremendous difficulties, the rains are tropical, crocodiles infest the rivers, wild elephant and rhinoceros charge the motor transport, giraffes object to the telephone wires, baboons protest against the shrapnel and lions reconnoiter the outlying patrols."

By the middle of the year 1915, this was the last colony

left to Germany. England decided to take it away from her, thereby eliminated Germany's competition as a colonizer.

To accomplish this task, some 50,000 troops were assembled. Most of this force was from South Africa, many from India, and, a few, from Rhodesia, British East Africa, and smaller British colonies. The Belgian Congo assisted with about 10,000 troops.



The German forces in East Africa numbered about 3,000 white and 12,000 native troops, and as many more native carriers, some of whom were available as soldiers. Von Lettow-Vorbeck was the commander. Since the outbreak of the war, he had trained his native soldiers well, and they knew how to use machine guns as the Germans on the Western Front did. Vorbeck was on his own, with no hope for reinforcements or aid from Germany. The British had command of the sea.

He realized that only by a stroke of good fortune could he hold German East Africa. Therefore, he decided that his mission was to require the British to use a large force, for a long time, if they wanted to seize the colony. This would keep these British troops away from the western front. The size and undeveloped state of the colony, the terrain, the vegetation, and the climate, favored the defender and hampered the attacker.

The German forces were scattered along the extensive border, with the major unit located at Taveta and New Moshi under Vorbeck. All commanders had orders to fight delaying actions, harass vulnerable lines of communication, and attack isolated columns, but not to stand and fight it out.

The mission of the British force was to seize and occupy German East Africa. This was assigned rather than a mission to defeat the armed enemy force. The home government was anxious to accomplish this seizure as soon as possible, no matter whether the armed forces were defeated or not.

The colony was invaded with several converging columns. One, of British troops, attacked from Rhodesia and swept the country on a wide front toward Tabora and Mahenge. A Belgian column entered from the Lake Kivu area and swept toward Tabora, in conjunction with a British column moving south from Muanza. The country between Lake Victoria and Mount Meri was impossible for any operations.

The main effort, under General Smuts, moved south from Mt. Kilimanjaro and was responsible for sweeping the eastern half of the colony.

This plan had the following advantages:

- (1) It provided for a speedy occupation of the colony.
- (2) It would force the scattered Germans to concentrate, if they couldn't be defeated in detail, at which time they could be attacked by the combined allied force.
- (3) Each column was as strong or stronger than any force the Germans would be able to concentrate at any one point, so there was no danger of having any one column annihilated.

Soon after the campaign was launched the Portuguese agreed to prevent the Germans from entering their colony. This meant that the Germans were surrounded, and it was only a matter of time until they would be defeated. As it turned out, later, the Portuguese were easy prey for the Germans and they crossed the Ruvuma with no difficulty and entered Portuguese East Africa.

Had the British advance been over open farmlands, as was the recent German advance in Poland, this campaign would have been a short one, but German East Africa was a virgin jungle country, and 21 months passed by before it was occupied.

In as much as each advancing column had similar experi-

HIS MOTHER-IN-LAW WAS PLENTY SORE

—but he's out of the dog house now!



"WHERE YA GOIN' with my pipe?" wailed Henry. "To the incinerator—where all smelly things belong," snapped his mother-in-law (who never approved of the marriage anyway).



"AM I A MOUSE?" mused Henry. "Must I give up smoking a pipe just because the old crab says it smells bad?" "Don't be a blithering idiot!" volunteered the gentleman going by.



"LOOKS LIKE YOU never tried the one tobacco that always smells sweet and cool and mild in a feller's pipe. Fill up with Sir Walter Raleigh, a fragrant blend of finest burleys."



MASTER OF ALL he surveys! Now even his mother-in-law treats Henry right since Sir Walter sweetened up his pipe. Try this mild tobacco on your home life. Fifty pipeloads, 15¢.

KEEP OUT OF THE
DOG HOUSE
WITH SIR WALTER

SIR WALTER
RALEIGH

New!
Cellophane tape
around lid seals
flavor in, brings
you tobacco 100
factory-fresh!

ences, this discussion will be confined to the trials of the main effort.

A hasty perusal of the map brings out the fact that this was no small area, being twice the size of Germany in 1914. Had there been a roadway and railway net, as we have in our country, or, as is found in European countries, this size would not have assumed such an important role, but German East Africa was undeveloped.

There were two single-track railroads, the Usambara, from New Moshi to Tanga; The Central, from Dar es Salaam to Kigoma. A very limited amount of rolling stock was available to the Germans and no replacements.

The roads were few in number, and, at best, were just trails cut through the bush and—vegetation. These roads and railways did not pass through wide open country, but rather were bordered with thick bush and jungle vegetation. This fact, made it mandatory that the invader use a large force to protect his lines of communication as he advanced deep into enemy territory. The Germans continuously raided these lines; they were so vulnerable. The soil of the colony consisted of alternate stretches of sand and cotton soil. We all know that sand is tough on transport, but, it may not be understood, that cotton soil is worse than Manassas mud when wet. During the rainy season, November through April, it would get so bad that human beings would sink up to their waists and often deeper. During the dry season this soil held up fairly well.

The existing roads and those developed by the British had to cross a countless number of rivers, streams, and swampy valleys. This meant that many bridges had to be constructed for the motor transport on which the British were dependent for supply. But worse than that, during the rains, these rivers and valleys became flooded and for miles the roads were covered with water as high as six feet or better.

The inadequate road net and the type of soil did more to hold up the British advance than did the German troops. It caused a failure to keep up supplies. British soldiers executed forced marches under tropical suns for days at a time, they fought, built roads, cut bush, and struggled through mountain passes. This is trying enough on any man, not born to the tropics when well fed. But, it is an unendurable hardship when accomplished on half rations, and less, for days at a time.

The motor transport was placed under a heavy strain and it broke under it. If there had been an unlimited amount of motor cars and spare parts available, the supply situation, during the dry season, could have been improved. Because of the war in Europe, these supplies were hard to get, and the campaign suffered along with broken down transport. During the rains all means of transport broke down.

Thousands of animals were used for transport work and thousands died. The "tsetse fly" flourished in all but a few sections of the colony. One bite from this insect means certain death to an animal. The average life in "fly" country was 6 weeks. Replacing wasted animals for transport and mounted use was always a major problem.

One other method of transport was used, the native carrier. The Germans depended on this method exclusively, hence could move; rain or shine. For them it was a practical method. Instead of becoming extended, their lines

of communications were getting shorter. They were falling back on their supply depots. Their force was smaller and they didn't require the large army of carriers, that a force as large as the British would. German carriers fed themselves, while British carriers had to be supplied with food. This meant that supply trains had to move food forward for the carriers, as well as for the troops. It was difficult enough trying to feed the latter. The invaders could not live off the country, because, as the Germans retired, they destroyed any food they couldn't carry away.

To further complicate the problem of supply, the Germans as they retired destroyed all bridges, felled trees and blocked the few existing roads, destroyed the railroad rolling stock, and tore up railroad tracks. It took three months to put the Central Railroad in working condition after its capture. Some 60 to 70 bridges had to be rebuilt, one span being 400 yards across the Ruwa River.

It was previously stated that the terrain and vegetation favored the defender. Vorbeck, as he retired before the British main effort, fell back on one excellent defensive position after another. His positions were selected so that his flanks were protected by rugged and precipitous mountains, by extensive swamps, belts of dense thorny bush, rivers, and streams. His front was usually covered by a stream. He blocked roads. As a result, the British had to cut their way through. They could be heard, thus advertising their approach. German positions were generally excellently concealed in the bush which covers most of the colony. The British advanced scouts could pass right by and never discover them. The Germans would wait quietly, and when a favorable target appeared, open fire. They used machine guns so skillfully that was rarely ever possible for the British to determine whether they were up against a rear guard or defensive position, therefore the advance was slow.

The British avoided attacking, frontally, any position selected by the Germans, they resorted to wide double envelopments and forced the Germans out by threatening their line of communication. The terrain provided natural defensive positions the flanks of which denied the use of close envelopments and Vorbeck knew how to get the most out of them. He was a master at it, and his native troops were right at home in their bush country. The British troops were not familiar with this type of terrain and vegetation. Wide envelopments were also necessary to canalize the enemy, keeping him out in front of the advancing troops and preventing him from shooting off in a new direction.

It frequently happened that these smaller columns would lose contact with each other, and then, the Germans would stand and fight it out with the isolated unit.

When the advance was made on Kissaki, one enveloping column went to the west of the mountains and another went through. They had radio contact with each other until the radio belonging to the mountain unit was wrecked. The two columns were supposed to attack the German position together. As a result of the loss of contact, the westernmost unit arrived at Kissaki alone, and attacked a prepared position and was repulsed. All attempts at coordination during this attack had been defeated by the dense bush and tall elephant grass. This unit retired on Whigo for the night. The next morning, the mountain column arrived and had the same failure. Because of the denseness of the

Would it have been better to have attacked the Germans as they were met in their prepared positions, and avoid the long marches? The battle of Mahiwa, fought in October,

Verbeck appreciated the fact that foreigners would suffer from these sicknesses, and made every effort to regulate the British advance so that the heavy rains would find them stopped on some river. He retired along the mountains in such a way that the British had to follow the valleys and

Established
1897

lowlands with their enveloping or turning columna.

As a matter of fact, the mountain trails were too difficult to negotiate with transport, so the British were more or less forced to stay with the valleys.

Because of these maladies, the numerically superior British were greatly reduced in effective strength. Even the men called effectives were suffering with a touch of malaria or dysentery. Add the sickness factor to the other difficulties confronting the British soldier and a rough estimate of his effectiveness would be about 50% or less, of the normal.

During the rainy season, when the men were suffering the greatest exposure and sickness, the supplying of the troops was the most difficult. At the time when full rations were needed the most, they were often reduced. On the Rufuji, the Nigerians were on quarter rations for weeks and nearly starved.

The German natives were not vulnerable to malaria. Having been born and raised in the region, they were more or less immune. Furthermore, Vorbeck moved his forces back along the healthier mountain regions.

The next offensive was made in July 1917, by columns operating out of Kilwa and Lindi. The Germans, now, had their backs to the wall, and offered a stiffer resistance than they had in the prior offensive. The battle of Mahiwa is an example. But the superiority in numbers of the British force, the danger of being surrounded, and the fact that Vorbeck was running low in ammunition, forced him to move into Portuguese East Africa in Nov. 1917, and German East Africa fell to the British.

Vorbeck took with him 2,000 fighting men and 3,000 carriers. The British with a new mission, to defeat Vorbeck, spent until the armistice trying to chase him down. Again the terrain and vegetation made it possible for the German to escape.

Aircraft during this period was in an experimental state so it was hard to predict from the experiences of this campaign what its value would be today under similar conditions. As a means for maintaining contact between widely separated units, it was of value. Its practical use for bombing is questionable because the vegetation conceals so well, that objectives are hard to locate. It was so in this campaign. The British had two squadrons, the Germans none, and, at no time, did the air attacks cause the Germans much concern.

Artillery played an important role, and the Germans were forced to evacuate positions because of its effective use. It was found that the observer had to be in the front line, if the artillery was to be effectively used, because all enemy positions were concealed in the edges of the dense bush. The British would be in the bush also, and between the two forces would be a clearing of a hundred to a thousand yards in width. The only way they could see each other was to be on the edge of the clearing. Because of this, the artillery observer always rode at the head of the column with the advance guard, in order to spot his guns on rapidly, when resistance was met.

To chase down an enemy in an area where the vegetation is plentiful and thick as it was in this colony, is like looking for a needle in a haystack. For this reason, it will be necessary to use several columns. This means a force will have to be large in order that each column will have inde-

pendent strength, as they will not be mutually supporting. The lack of a roadnet and the difficulty of trying to penetrate the bush will prevent it.

In an undeveloped country, maps are scarce and inaccurate, therefore timed advances and attacks by separated columns are next to impossible.

Campaigning in the jungle where malaria and dysentery are so prevalent and fatigue comes quickly to the white man, indicates that very elaborate steps must be taken to preserve the health of the command. The British medicos couldn't cope with the situation in this campaign and the casualties due to sickness were excessive. The Italian success in holding down sickness in Ethiopia is an indication of what careful planning can do.

Troops will need frequent relief so that they can recuperate or else will become dilatory and listless. This will immediately reduce the effectiveness of the command.

German East Africa is probably the only place in the world where animals will be dissipated to the extent that they can't be depended on for transport. In the jungle you can't use motors everywhere. The roads are usually few. Unfortunately a military force is required to leave the main roads, and then supply becomes a problem of great importance. At this time, the commander gives a dozen thoughts to supply for every one to tactical moves, instead of the conventional two. Situations such as this, must be visualized before they arise, so that adequate steps may be taken to provide the remedy.

What did the British gain from this conquest? One soldier described the colony as "A blooming zoo, without the cages." It was; but, it also was a potential source of manpower. Had the Germans retained it, we would probably find, that, today, there would be a fine German army of African troops there. The Germans made excellent soldiers out of the natives. Furthermore, the colony would no doubt be a base from which Hitler could launch campaigns for greater conquests.

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THE POCKET SIGNAL DISK

BY COL. L. A. CLAPP, U.S.M.C.-Ret.

Since the disk is a revised publication in the form of a device it may warrant a separate review.

It does not apply to radio in which sound methods are employed. It does however fit a wider field in being adaptable for general use and meets with special favor among Regimental, Battalion, Company and Battery Commanders, certain Special Troops and of course in Naval and other Maritime Services. It serves as a ready reference for Officers and there could well be a slogan as "One for every Dispatch Case."

Its fascinating and impelling feature encourages spare time study and contributes as a positive aid in maintaining interest in the various forms of auxiliary means of communication.

TANKS AND TERRAIN

(Continued from page 26)

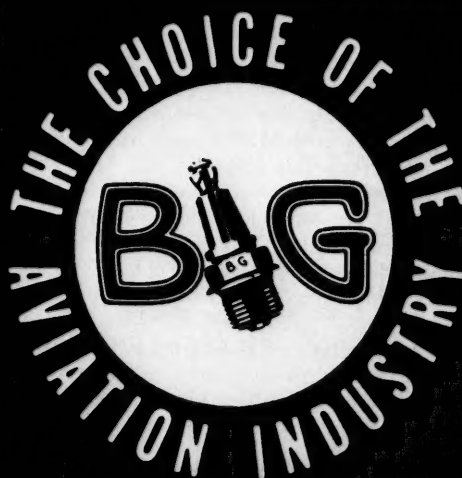
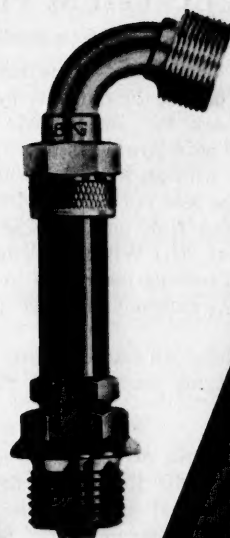
combat units must be left to the initiative of the lower commanders. Any hostile resistance they are unable to overcome must be cared for by dive bombers and artillery, this latter being landed as soon after the first wave as is possible. The accomplishment of this particular phase calls for close liaison between aviation, artillery and tanks and can only be completed by much training, and by having available enough artillery and aircraft for the concentrations called for.

The limit to which the forward assault units can move inland is directly proportional to the speed with which supporting infantry can be landed and moved to the front. However, if the materiel available is sufficient there need be no dead period in a landing. That is, there need not be a period of time when the infantry stops its forward movement due to the fear of over extension. This stopping and accompanying consolidation of positions may be done at night after the day's operations. Supporting infantry can be brought up so quickly by the use of combat cars that it always will be directly in rear of the tanks.

Enough tanks are held in reserve to constitute a fast, powerful striking force in the event of a counter attack by the enemy.

As this whole operation depends on speed for its successful conclusion, it must be remembered that great fire power is necessary. There must be a preponderance of automatic weapons available for use.

Basically nothing has changed. All that is needed is an appreciation by the individual of the quickened tempo of war, and a full understanding of conditions governing the use of motorized combat equipment. In a battle of this sort with the rapidly changing positions it will no longer be possible to wait for the situation to stabilize before acting. Split second decisions, even though wrong, sometimes must be made. There will be an increased confusion due to the rapidity with which everything will be moving, but this can only be overcome by training. We are no longer pawns on a giant chessboard. We must act with individual initiative.



Contractors to the United States
Army, Navy and Coast Guard
and Aircraft Engine Builders.



THE B & G CORPORATION

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KEEP THEM FIRING

(Continued from page 23)

Remedy: Consult the instructions furnished for your gun, and correct the difficulty by cleaning, replacing, bending back, etc. But suppose you lack time or facilities. The following is an example of emergency measures with an M1903 Springfield or its equivalent. Your sear is broken and the rifle will not stay cocked. (a) Hold and aim rifle using left hand only for support. (b) With thumb and forefinger of right hand pull cocking piece fully to the rear and release it smartly. Probably you will succeed in firing your rifle.

"And how can man die better
Than facing fearful odds," etc., etc.

TYPE II

Failure to unlock the breech

1. **Cause:** Usually dirt or fouling in the mechanism. In gas-operated weapons the gas port may be plugged, or the operating rod jammed, bent, etc. In recoil-operated weapons the barrel may be jammed due to foreign matter, etc.

Remedy: Know your gun and follow the instructions furnished.

2. **Cause:** Defective cartridge. The defect may be due to soft brass in the cartridge case, or, in automatic arms, insufficient pressure, although sometimes too much pressure.

Remedy: Remove the cartridge case by force if necessary. Oil or saliva on the case may help if you can introduce any. A cleaning rod will help in some instances. Consult instructions furnished.

3. **Cause:** On bolt action repeating rifles a dirty mechanism, especially dirt on unlocking cams (primary extraction cams on M1903), or a bad cartridge chamber may create this difficulty.

Remedy: Keep the parts clean and use oil if the climate is not too cold. Always keep the chamber as clean as possible. You could have discovered machining defects in the chamber during practice firing by examining the condition of the empty cartridge case bodies.

4. **Cause:** This type of stoppage can be caused by innumerable mechanical defects, or by errors or weaknesses in design, resulting in burrs, breakages, etc.

Remedy: Letter of complaint, etc.

TYPE III

Failure to extract empty case—primary

Introductory comment: This is undoubtedly the most frequent serious stoppage. It is especially serious in automatic weapons. In most instances if you can't fire the rifle or gun and loosen the empty case, then you are "for it."

1. **Cause:** See Type II. If it will not unlock, it can not extract.

Remedy: See Type II.

2. **Cause:** Broken or defective extractor.

Remedy: Replace the extractor. Beware of guns in which the change of extractors is not very readily accomplished, regardless of sales talk. They will

break, and not always because of a fault of the extractor. So carry a spare extractor (as well as a spare firing pin if possible in your butt stock trap, pants pocket, etc.)

3. **Cause:** Fouled, sanded, or defectively machined chamber which causes the brass to stick tightly to the walls.

Remedy: Keep chamber clean. Do not load dirty cartridges into your gun. Keep belts, magazines, and clips out of sand and dirt. Keep magazine clean.

4. **Cause:** Defective ammunition, having soft brass cases, or excessive pressure due to improper loading or due to a hot chamber.

Remedy: If you have sticky brass-cased ammunition, try to wet the cases with water, saliva, or a few drops of oil, etc. Do not use oil unless you have to. It is not safe to use oil on cartridges fired from the M1903, M1917, M1, etc. This can be done in the B.A.R., B.M.G., or in other rifles or guns having extra breech-locking strength.

Do not leave a cartridge in a hot chamber very long. It may preignite, but apart from that, the pressure will be excessive when you fire it, and the case may stick and fail to extract. This difficulty is avoided in automatic weapons which are cocked with the breech open, as, for example, the B.A.R., Bren gun, etc. It is avoided in rifles by providing for heat radiation from the barrel. The use of ammunition having reduced chamber pressure, such as M2, reduces this hazard.

5. **Cause:** Broken cartridge case rim, in turn due to defects in the brass, or due to jamming the rim of a sticky case which refuses to extract for reasons given above (chamber, soft brass, etc.)

Remedy: This is a bad stoppage. If you can exchange barrels, do so at once. If you have a rod, push out the case. If you can get at the chamber you may be able to pry out the case. An ounce of prevention is worth a ton of cure in this instance. You should have kept your chamber clean. If the gun showed a tendency to extract badly, you should have restored to saliva or water or oil on the cartridges. In this situation a rainy day is distinctly advantageous. Even muddy water is an asset. Good clean soft watery mud is useful.

6. **Cause:** Occasionally, due to defective ammunition, the primer of a fired cartridge may blow out or "pop." A popped primer may cause trouble in an automatic weapon. Sometimes the primer will allow gas to escape which in turn may cause the extractor to be ripped through the rim of the cartridge. This is beyond your control, unless you have excessive headspace which would contribute materially to blown or popped primers, there being insufficient support for the primer during the interval of high pressure. Therefore, check your headspace. Aside from this, you can resort in emergency to saliva, water, or oil on the cartridges. This remedy will cure popped primers in many instances.

TYPE IV

Failure of the breech to open, or failure of secondary extraction, or failure to pull the shell out of the chamber.

(Type IVB. In belt-fed weapons, failure to extract cartridge from belt.)

1. **Cause:** The empty case may be ruptured in firing, and the forward portion left in the chamber while the head or rear position is pulled out. This may be due to excessive headspace or defective ammunition. **Remedy:** Correct the headspace. Use broken shell extractor, if any. Put wet sand on a live cartridge, jam it into chamber, and try to extract broken portion of fired round. If you suspect the occurrence of this stoppage, again resort to saliva, water, or oil on the cartridges.
2. **Cause:** Sluggish action resulting from dirt, sand, fouling, rust, etc. **Remedy:** Clean your gun, and try to keep it clean. Most guns will perform better if they are clean. Lubrication is necessary on automatic weapons, but must be avoided in cold climates. Under normal conditions and in temperatures above freezing a little oil does no harm. (On weapons which require special lubrication, such as graphite, grease, etc., follow instructions carefully as far as possible.)
3. **Cause:** Excessive tension in mainspring (automatic weapons). **Remedy:** Reduce tension if possible. You should have adjusted this in practice firing.

4. **Cause:** Empty case may fall out of bolt head due to lack of proper support on head of case, in turn due to defective extractor in most instances.

Remedy: Correct or replace the extractor.

5. **Cause:** Excessive friction on bolt resulting from (a) too much pressure from hammer (in guns of this type) actuating spring (or equivalent); or (b) too much tension in magazine follower spring when the magazine is fully loaded; or (c) in belt-fed guns, too much resistance in pulling the cartridge from the belt.

Remedy: In emergency use lubricants or water, etc., except on belt. Free up cartridge loops if possible or change belt. If springs have too much tension, you should have ascertained this in practice firing, and then you could have consulted your armorer.

If you have a belt-fed gun you should study your instruction manual carefully. Web belts are affected by the weather. New belts are inclined to be very stiff. Metal links rust, often jam, and should be carefully inspected. You should pay careful attention to the extractor claw which pulls the rounds from the belt loops.

TYPE V

Failure to eject the empty case

1. **Cause:** Broken, bent, or defective ejector.





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SHEAFFER'S



Safety Skrip

PLASTIC FLASK!

Here is the non-breakable, non-leaking way to carry writing fluid. Belongs in every service kit.

Remedy: Correct ejector if possible. There is very little you can do now except operate the gun as a single loader.

2. *Cause:* Any of the preceding types of stoppages may cause a failure to eject, except, of course, misfires and failures to unlock. Type IV is the most likely cause.
3. *Cause:* This may be due to defective ammunition, lacking sufficient pressure to operate the mechanism adequately.
Remedy: You might oil your cartridges to increase the operating power. Otherwise you can operate the weapon by hand and write a letter of complaint.

TYPE VI

Failure to engage head of cartridge in re-loading

1. *Cause:* See Type IV and Type V. The bolt failed to travel sufficiently rearward to engage the next round. This may be due to a basic defect in the weapon, or due to dirt, or lack of lubrication, etc., in guns depending upon lubrication for proper functioning. It should be noted that in most weapons ejection takes place before the bolt head has reached a point in rear of the magazine or feed path. *Thus, the empty case may be ejected, yet the weapon will fail to feed due to defects other than those of the magazine feed itself.*
Remedy: See Types IV and V. In emergency use lubrication if possible (saliva, water, oil, etc.)
2. *Cause:* Defective or broken magazine spring, or jammed follower, or jammed cartridges, or deformed cartridges.
Remedy: Try to correct defective item. Be careful in loading ammunition. You may be forced to fire by single-loading.
3. *Cause:* In weapons having a staggered feed (M1903, M1917, Mauser, Enfield, etc.), the cartridges may jam side by side.
Remedy: Remove floor plate, drive out cartridges, replace, reload.
4. *Cause:* In weapons which accept the charger as a functioning part of the magazine, care should be used to insure that the chargers are not rusted, dented, or otherwise defective as these may otherwise cause a serious stoppage.
Remedy: Inspect chargers before using. Be sure the chargers are not bent, rusted, or dirty.
5. *Cause:* This type of stoppage may occur in belt-fed machine guns due to causes which prevent the breech-block from moving rearward with sufficient force. For example, a Browning M1917 gun failed to feed because the barrel chamber was unduly rough due to careless finishing. After the chamber was smoothed up, the weapon functioned perfectly.
Remedy: In emergency use saliva, water, or oil on the cartridges.
6. *Cause:* Sand in the action may cause this stoppage, as the bolt may be prevented from traveling fully rearward.
Remedy: Clean the mechanism.

TYPE VII

Failure to load the cartridge into the chamber.

1. *Cause:* Broken shell or piece of shell or foreign matter in the chamber.
Remedy: Clean out the chamber.
2. *Cause:* Deformed cartridge.
Remedy: Check on cause of deformation. This may be due to the ammunition or it may be due to a fault in the rifle, usually the magazine, or the point of the cartridge may be deformed in passing from the lips of the magazine toward the chamber. This is more frequent in weapons having a staggered feed as the points of the cartridges must cross as well as rise to enter the chamber. (Example: B.A.R. M1918).
3. *Cause:* Bent or deformed feed lips in the magazine.
Remedy: Repair or replace magazine if detachable. If the lips are machined this is less likely though more possible if the cartridges are staggered.
4. *Cause:* In weapons which feed the cartridges at a sharp angle, or in any weapons which have weak ejection due to dirt, excessive mainspring tension, etc., there may occur what is known as "riding the cartridge." The bolt will start the cartridge by barely touching the perpendicular face of the base of the case. As the bolt moves forward, the base of the case drops below the bolt face while the point of the cartridge is rising into the chamber. The bolt then "rides" on the cartridge, pushing it forward until it jams the bolt.
Remedy: For immediate action, pull the operating handle rearward slightly and shake the gun. This may permit the cartridge to loosen so that the base of the case can be contacted by the bolt. The round may then be chambered, except in weapons cocked with the bolt open, such as the B.A.R. In such guns the round should be removed from the breech. This may be done by releasing the detachable magazine. If this stoppage is a recurring one, check the action for dirt, check feed lips, check magazine spring, check detachable magazines to insure proper engagement in the magazine aperture.
5. *Cause:* Insufficient clearance for base or head of cartridge to slide under extractor claw into bolt face, or deformity in cartridge.
Remedy: Examine extractor claw. Check for dirt or brass around claw. Examine extracting groove in cartridge. This difficulty is more likely to be encountered in feeding from a staggered-feed magazine as the angles are more acute in loading.
6. *Cause:* Weak mainspring, dirt in the action, friction of operating parts, excessive tension in magazine spring, or a combination of these.
Remedy: In emergency push the operating handle forward with hand, or pull out the round. Oil may alleviate this condition momentarily, but check the cause at the first opportunity.

TYPE VIII

Failure of breech to close fully, or failure to lock

1. *Cause:* This may be due to causes listed under Type VII above.
Remedy: See remedies listed under Type VII above.

2. *Cause:* Insufficient headspace.

Remedy: If possible increase the headspace (example: M1917 heavy Browning). You should have learned this in practice firing. In emergency you will find that you can recock the gun and lock it. The cartridge will probably be reduced in size after its first chambering so that the bolt will lock on the second trial.

3. *Cause:* Defects, dirt, burrs, etc., on locking components, cams, etc.

Remedy: Try oil in emergency. Examine and correct this condition at the first opportunity.

NOTE: Failure to lock generally results in a misfire. The cycle of operation is now completed by stating a cause for Type I, misfires, as:

"Failure of the bolt to lock." If the weapon can fire with the bolt unlocked, your troubles may be over unless you have a very strong, well-designed receiver to protect you. Do not be alarmed. Modern weapons are well designed in this respect.

HEADSPACE

A discussion of stoppages and malfunctions necessarily requires considerable reference to "headspace," a much-misunderstood and somewhat mysterious term describing a very simple matter.

To simplify this explanation of headspace, it is best to ignore the term for the moment, and merely consider the cartridge, the barrel chamber, and the breech-block or bolt.

Rimless cartridges, such as the .30 U. S. M1906 (M1, M2), the 6.5, 7, 7.65, 7.9 or 8 mm., etc., have no rim, as do the .303 Mark VII (British) and 7.62 mm. cartridges (etc.), to arrest their entrance beyond the barrel chamber. Instead the rimless cartridge is positioned by its shoulder which rests against the corresponding shoulder of the chamber.

When the cartridge has been pushed into the chamber, the bolt (or breech-block) must lock, so that the face of the bolt rests snugly against the base or rear end of the cartridge.

The bolt must have room enough to lock on the cartridge. For example, on the M1903 Springfield, the rear faces of the bolt lugs must clear the front faces of the receiver abutments or shoulders in order that the bolt may be rotated into the fully locked position.

The .30 U. S. M1906 rimless cartridge stops when its shoulder rests on the chamber shoulder. Therefore, the shoulder in the chamber is a locating point. Assume in all instances that the bolt lugs are resting on their abutments in considering the location of the bolt face, against which the base of the cartridge case must obtain support under the pressure of the gases generated in firing.

Now suppose that the distance measured from the shoulder of the cartridge case to the base of that case is 1.943 inches. Suppose that the distance measured from the shoulder of the chamber to the face of the bolt (locked against its abutments) is 1.933 inches. Can the bolt lock under these conditions? No, because there is no clearance.

Suppose the cartridge measurement were 1.942 inches and the chamber-to-bolt-face measurement were 1.952 inches. Can the bolt close? Yes, with plenty to spare.

Why then all this fuss? Why not allow plenty of room

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for the bolt to lock, as in the last illustration? Why not allow an extra amount of clearance or space for the head or base of the cartridge?

The chamber-to-bolt-face measurement represents the *headspace* and the reasons this must *not* be excessive are numerous in rimless cartridge weapons.

1. **Firing:** The firing pin will literally push the cartridge forward against the chamber shoulder as the pin falls against the primer. This would so cushion the firing pin blow that a misfire might result. If the cartridge were already snugly thrust against the chamber shoulder, the firing pin might not be long enough to reach the primer effectively.
2. **Case rupture:** Under pressure the brass case expands tightly against the chamber walls. The head of the case stretches back sharply because it is thicker than the forward position of the case and is therefore less elastic under pressure. Unless the bolt face is close to the case head, the case will stretch beyond its limit toward the rear and *rupture*. Oiling the whole case permits it to slide rearward in one piece until the bolt face is contacted, but such oiling materially increases the thrust on the locking lugs and may rupture them unless they are very strong.
3. **Hammering the bolt:** Excessive headspace permits the bolt lugs to be out of actual contact with their abutments. In firing the bolt is violently thrust back in such a way as to hammer the locking lugs against their abutments. This may prove serious, and invariably creates burrs and fractures on the lugs.
4. **Accuracy:** Excessive headspace destroys accuracy, for accuracy is essentially dependent upon uniformity. The cartridge cases and, especially, the bullets must be seated uniformly in the chamber and throat of the barrel. Excessive headspace makes it possible for the cartridges to be seated with sufficient variation to upset the accurate grouping of shots from the weapon.

On bolt-action rifles such as the M1903 Springfield the usual headspace for best performance is about 1.942-1.943 inches. Service maximum limits are 1.946 inches for new rifles, and 1.950 for used arms. The minimum is 1.940 inches.

Semi-automatic rifles having rotary bolts are usually held around 1.942-1.948 inches.

Because of the dimensional variations inescapably encountered in the production of any weapon, it is not entirely practicable to hold the headspace limits much below plus or minus three one-thousandths of an inch (± 0.003).

The headspace problem is less acute with rim-cased ammunition. The thickness of the rim is a controlling and more easily established dimension. The rim serves as a more positive means of arresting the cartridge in the chamber. For this reason misfires are less likely with rim-cased ammunition. Unfortunately, however, rimmed ammunition is very badly designed for magazine feeding, especially in automatic weapons.

To summarize, the headspace in a rifle or machine gun is the distance measured from the shoulder of the chamber (in rimless calibers) to the face of the locked bolt.

If the headspace is insufficient the weapon will not fire.

If it is excessive the following difficulties may result:

- Misfires
- Ruptured cases
- Damage to locking components (lugs, etc.)
- Loss of accuracy

Headspace is normally determined by employing a headspace gage which is a steel plug shaped like a cartridge case without the neck. However, it is possible to obtain a rough check on the condition of a weapon by closing the bolt carefully on any undeformed empty cartridge case which has been fired in a weapon known to have correct headspace, or, in emergency, an unfired case. In fact, with a little experience it is possible to determine the headspace within reasonable limits by trying the fit of live cartridges. In doing so one must be sure not to mistake a tight bullet seat in the chamber throat for a tight chamber.

SPECIAL NOTE ON BROWNING M1917 HEAVY MACHINE GUN

In order to obtain maximum accuracy and the best general performance from the heavy Browning, the fol-



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lowing method of adjusting the headspace is recommended:

1. Assemble the barrel to the barrel extension, screwing in the barrel till it stops on the shoulder.
2. Assemble the entire gun.
3. Pull the operating handle to the rear and release it smartly.
4. Pull the trigger.
5. If you can not pull the trigger, the headspace is too tight. Therefore, open the cover, and, using the wrench provided in the parts' kit, unscrew the barrel one notch on the ratchet.
6. Pull handle and release it.
7. Try the trigger.
8. Repeat, if necessary, until the trigger can be released. When this is possible you will have obtained the minimum headspace for your gun. If desired, you may then unscrew the barrel one extra notch on the ratchet to approach the medium and maximum limits.

THE WINGED BULLET

(Continued from page 21)

much. I know it don't sound reasonable, but listen to this.

F equals—the lieutenant wrote it out here somewhere—F equals MV squared, when F is the force, M is the mass, and V is the velocity.

That may not mean much, but this does. Say we have a gun that throws a one-pound shell at 1,000 feet a second. That shell hits with one pound times 1,000 times 1,000 equals 1,000,000 foot-pound-seconds, if there is any such thing.

Suppose we want to hit harder. We can use a two-pound shell and throw it at the same speed. That load will give us two times 1,000 times 1,000 equals 2,000,000 foot-pound-seconds. (O'Shaughnessy, are you dreaming about what you did on your last leave or what you're planning on doing on your next?) So if we double the weight of the shot, we double the force.

Another way of hitting harder is to keep our one-pound shot, and throw it at 2,000 feet a second. In that case we hit with one pound times 2,000 times 2,000 equals 4,000,000 foot-pound-seconds. So by doubling the speed, we get around four times the hitting power.

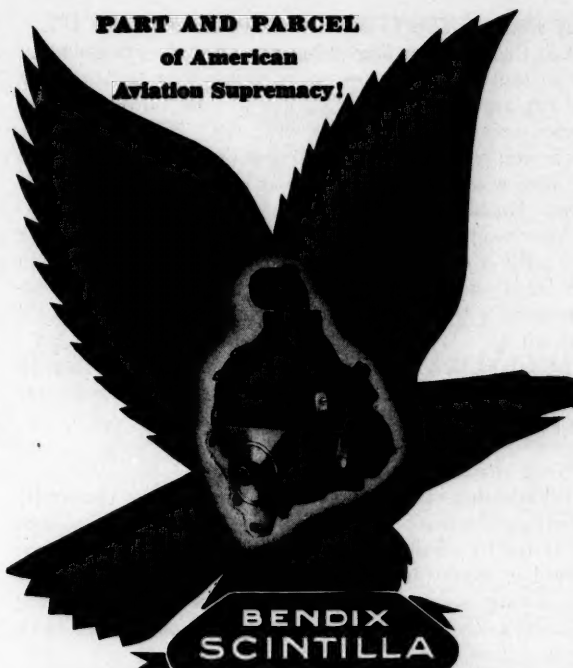
Any questions?

Well, Swenson, if a gun hits four times as hard on the front end, what is it going to do at the—let's see, the riflings used to try to hold the bullet back, so the gun kicked back harder—but the bullet went out half as fast, so it kicked softer—but we're using about the same powder charge, so—we'd better see the lieutenant about that.

Anyway, you can figure out what a change this speed is going to make in things as they stand. The major said he's seen these guns shoot through an inch of steel at 300 yards, and an inch and a quarter, point-blank. An antitank gun carried by every rifle—musketeer, that's what it means.

Right now, we're only getting one per platoon—for snipers—but when they're regular issue, we'll probably make the Mungo Armored Force put on so much steel

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they won't be able to waddle out of the way of a 155.

But there's other angles besides what they're going to do to tanks. Right now we're using four to ten leads on airplanes, because we've got a slow bullet and the planes are getting faster every day. Hitting a plane while you're aiming that wide is blind luck—and if you hit him with a lead-filled ball, what have you got anyhow? Nothing.

After we get these new guns, and I understand there's two million of 'em on order, we'll be able to use two to five leads—and we'll hit three times as many of 'em. Furthermore, with this AP tearing through the armor, they'll stay hit.

As far as that goes, we'll cut our leads in half for all moving targets, men, motors, or mechanized, because our bullets will get there in half the time.

Any questions?

Next formation with arms, outside, in—

What's that, Higgenbottom? What makes the bullet fly straight when there's no riflings—? Well, why does an arrow fly straight, what makes an air bomb nose on, why does a mortar shell—say, what's the big idea? Are you trying to—maybe you better come with me during the break, and I'll see if the company commander can't explain it to you.

Dismissed!

GUERRILLA WARFARE IN CHINA

(Continued from page 19)

These guerrilla operations must not be considered as an independent form of warfare. They are but one step in the total war; one aspect of the revolutionary struggle. They are the inevitable result of the clash between oppressor and oppressed when the latter reach the limits of their endurance. In our case these hostilities began at a time when the people were unable to endure any more from the Japanese imperialists. Lenin said: "A people's insurrection and a people's revolution are not only natural but inevitable." (People and Revolution.) We consider guerrilla operations as but one aspect of our total or mass war because they, lacking the quality of independence, are of themselves incapable of providing a solution to the struggle.

Guerrilla warfare has qualities and objectives peculiar to itself. It is a weapon that a nation inferior in arms and military equipment may employ against a more powerful aggressor nation. When the invader pierces deep into the heart of the weaker country and occupies her territory in a cruel and oppressive manner there is no doubt that conditions of terrain, climate, and society in general offer obstacles to his progress and may be used to advantage by those who oppose him. In guerrilla warfare we turn these advantages to the purpose of resisting and defeating the enemy.

During the progress of hostilities guerrillas gradually develop into orthodox forces that operate in conjunction with other units of the regular army. Thus the regularly organized troops, those guerrillas who have attained that status, and those who have not reached that level of development combine to form the military power of a national

revolutionary war. There can be no doubt that the ultimate result of this will be victory.

Both in its development and in its method of application guerrilla warfare has certain distinctive characteristics. We first discuss the relationship of guerrilla warfare to national policy. Because ours is the resistance of a semi-colonial country against an imperialism our hostilities must have a clearly defined political goal and firmly established political responsibilities. Our basic policy is the creation of a national united anti-Japanese front. This policy we pursue in order to gain our political goal which is the complete emancipation of the Chinese people. There are certain fundamental steps necessary in the realization of this policy, to wit:

1. Arousing and organizing the people;
2. Achieving internal unification politically;
3. Establishing bases;
4. Equipment of forces;
5. Recovery of national strength;
6. Destruction of enemy's national strength;
7. Regaining lost territories.

There is no reason to consider guerrilla warfare separately from national policy. On the contrary, it must be organized and conducted in complete accord with national anti-Japanese policy. It is only those who misinterpret guerrilla action who say, as does Jen Ch'i Shan, "The question of guerrilla hostilities is purely a military matter and not a political one."

Those who maintain this simple point of view have lost sight of the political goal and the political effects of guerrilla action. Such a simple point of view will cause the people to lose confidence and will result in our defeat.

What is the relationship of guerrilla warfare to the people? Without a political goal guerrilla warfare must fail, as it must if its political objectives do not coincide with the aspirations of the people and their sympathy, cooperation and assistance can not be gained. The essence of guerrilla warfare is thus revolutionary in character. On the other hand, in a war of counter revolutionary nature there is no place for guerrilla hostilities. Because guerrilla warfare basically derives from the masses and is supported by them it can neither exist nor flourish if it separates itself from their sympathies and cooperation. There are those who do not comprehend guerrilla action and who therefore do not understand the distinguishing qualities of a people's guerrilla war who say: "Only regular troops can carry on guerrilla operations." There are others who, because they do not believe in the ultimate success of guerrilla action, mistakenly say: "Guerrilla warfare is an insignificant and highly specialized type of operation in which there is no place for the masses of the people." (Jen Ch'i Shan.) There are those who ridicule the masses and undermine resistance by wildly asserting that the people have no understanding of the war of resistance. (Yeh Ch'ing.) The moment that this war of resistance dissociates itself from the masses of the people is the precise moment that it dissociates itself from hope of ultimate victory over the Japanese.

What is the organization for guerrilla warfare? Though all guerrilla bands that spring from the masses of the people suffer from lack of organization at the time of their for-

mation they all have in common a basic quality that makes organization possible.

All guerrilla units must have political and military leadership. This is true regardless of the source or size of such units. Such units may originate locally, in the masses of the people; they may be formed from an admixture of regular troops with groups of the people, or they may consist of regular army units intact. Nor does mere quantity affect this matter. Such units may consist of a squad of a few men, a battalion of several hundred men, or a regiment of several thousand men. All these must have leaders who are unyielding in their policies, resolute, loyal, sincere, and robust. These men must be well educated in revolutionary technique, self confident, able to establish severe discipline, and able to cope with counter-propaganda. In short, these leaders must be models for the people. As the war progresses such leaders will gradually overcome the lack of discipline, which at first prevails; they will establish discipline in their forces, strengthening them and increasing their combat efficiency. Thus eventual victory will be attained.

Unorganized guerrilla warfare can not contribute to victory and those who attack the movement as a combination of banditry and anarchism do not understand the nature of guerrilla action. They say: "This movement is a haven for disappointed militarists, vagabonds and bandits" (Jen Ch'i Shan), hoping thus to bring the movement into disrepute. We do not deny that there are corrupt guerrillas, nor that there are people who under the guise of guerrillas indulge in unlawful activities. Neither do we deny that the movement has at the present time symptoms of a lack of organization, symptoms which might indeed be serious were we to judge guerrilla warfare solely by the corrupt and temporary phenomena we have mentioned. We should study the corrupt phenomena and attempt to eradicate them in order to encourage guerrilla warfare, and to increase its military efficiency. "This is hard work, there is no help for it, and the problem can not be solved immediately. The whole people must try to reform themselves during the course of the war. We must educate them and reform them in the light of past experience. Evil does not exist in guerrilla warfare but only in the unorganized and undisciplined activities which are anarchism." (Lenin—Guerrilla Warfare.)

What is basic guerrilla strategy? Guerrilla strategy must primarily be based on alertness, mobility, and attack. It must be adjusted to the enemy situation, the terrain, the existing lines of communication, the relative strength, the weather, and the situation of the people.

In guerrilla warfare select the tactic of seeming to come from the east and attacking from the west; avoid the solid, attack the hollow; attack; withdraw; deliver a lightning blow, seek a lightning decision. When guerrillas engage a stronger enemy they withdraw when he advances; harass him when he stops; strike him when he is weary; pursue him when he withdraws. In guerrilla strategy the enemy's rear, flanks, and other vulnerable spots are his vital points, and there he must be harassed, attacked, dispersed, exhausted and annihilated. Only in this way can guerrillas carry out their mission of independent guerrilla action and coordination with the effort of the regular armies. But, in



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spite of the most complete preparation, there can be no victory if mistakes are made in the matter of command. Guerrilla warfare based on the principles we have mentioned and carried on over a vast extent of territory in which communications are inconvenient will contribute tremendously towards ultimate defeat of the Japanese and consequent emancipation of the Chinese people.

A careful distinction must be made between two types of guerrilla warfare. The fact that revolutionary guerrilla warfare is based on the masses of the people does not in itself mean that the organization of guerrilla units is impossible in a war of counter revolutionary character. As examples of the former type we may cite Red guerrilla hostilities during the Russian revolution; those of the Reds in China; of the Abyssinians against the Italians for the past three years; those of the last seven years in Manchuria, and the vast anti-Japanese guerrilla war that is carried on in China today. All these struggles have been carried on in the interests of the whole people or the greater part of them; all had a broad basis in the national man power, and all have been in accord with the laws of historical development. They have existed and will continue to exist, flourish and develop as long as they are not contrary to national policy. The latter type of guerrilla warfare directly contradicts the law of historical development. Of this type we may cite the examples furnished by the White Russian guerrilla units organized by Denikin and Kolchak; those organized by the Japanese; those organized by the Italians in Abyssinia; those supported by the puppet governments in Manchuria and Mongolia, and those that will be organized here by Chinese traitors. All such have oppressed the masses, and have been contrary to the true interests of the people. They must be firmly opposed. They are easy to destroy because they lack a broad foundation in the people. If we fail to differentiate between the two types of guerrilla hostilities mentioned it is likely that we will exaggerate their effect when applied by an invader. We might arrive at the conclusion that "the invader can organize guerrilla units from among the people." Such a conclusion might well diminish our confidence in guerrilla warfare. As far as this matter is concerned we have but to remember the historical experience of revolutionary struggles.

Further, we must distinguish general revolutionary wars from those of a purely "class" type. In the former case the whole people of a nation without regard to class or party carry on a guerrilla struggle which is an instrument of the national policy. Its basis is therefore much broader than is the basis of a struggle of class type. Of a general guerrilla war it has been said: "When a nation is invaded the people become sympathetic to one another and all aid in organizing guerrilla units. In civil war, no matter to what extent guerrillas are developed they do not produce the same results as when they are formed to resist an invasion by foreigners." (Civil War in Russia.) The one strong feature of guerrilla warfare in a civil struggle is its quality of internal purity. One class may be easily united and perhaps fight with great effect, whereas in a national revolutionary war guerrilla units are faced with the problem of internal unification of different class groups. This necessitates the use of propaganda. Both types of guerrilla war

are however similar in that they both employ the same military methods.

National guerrilla warfare, though historically of the same consistency has employed varying implements as times, peoples and conditions differ. The guerrilla aspects of the Opium War, those of the fighting in Manchuria since the Mukden incident, and those employed in China today are all slightly different. The guerrilla warfare conducted by the Morroccans against the French and the Spanish was not exactly similar to that which we conduct today in China. These differences express the characteristics of different peoples in different periods. Although there is a general similarity in the quality of all these struggles there are dissimilarities in form. This fact we must recognize. Clausewitz in "On War" wrote: "Wars in every period have independent form and independent conditions and therefore every period must have its independent theory of war." Lenin in "On Guerrilla Warfare" said: "As regards the form of fighting it is unconditionally requisite that history be investigated in order to discover the conditions of environment, the state of economic progress and the political ideas that obtained, the national characteristics, customs and degree of civilization." Again: "it is necessary to be completely unsympathetic to abstract formulae and rules and to study with sympathy the conditions of the actual fighting for these will change in accordance with the political and economic situations and the realizations of the people's aspirations. These progressive changes in conditions create new methods."

If, in today's struggle, we fail to apply the historical truths of revolutionary guerrilla war we will fall into the error of believing with T'ou Hsi Sheng that under the impact of Japan's mechanized army "the guerrilla unit has lost its historical function." Jen Ch'i Shan writes: "In olden days guerrilla warfare was part of regular strategy but there is almost no chance that it can be applied today." These opinions are harmful. If we do not make an estimate of the characteristics peculiar to our anti-Japanese guerrilla war but insist on applying to it mechanical formulae derived from past history we are making the mistake of placing our hostilities in the same category as all other national guerrilla struggles. If we hold this view we will simply be beating our heads against a stone wall and we will be unable to profit from guerrilla hostilities.

To summarize: What is the guerrilla war of resistance against Japan? It is one aspect of the entire war, which although alone incapable of producing the decision, attacks the enemy in every quarter, diminishes the extent of area under his control; increase our national strength and assists our regular armies. It is one of the strategic instruments used to inflict defeat on our enemy. It is the one pure expression of anti-Japanese policy: that is to say, it is military strength organized by the active people and inseparable from them. It is a powerful special weapon with which we resist the Japanese and without which we can not defeat them.

PART TWO

THE RELATION OF GUERRILLA HOSTILITIES TO REGULAR OPERATIONS

The general features of orthodox hostilities, that is, the war of position and the war of movement, differ funda-

mentally from guerrilla warfare. There are other readily apparent differences such as those in organization, armament, equipment, supply, tactics, command; in the conception of the terms "front" and "rear": in the matter of military responsibilities.

When considered from the numerical point of view guerrilla units are many; as individual combat units they may vary in size from the smallest of several score or several hundred men, to the battalion or the regiment of several thousand. This is not the case in regularly organized units. A primary feature of guerrilla operations is their dependence upon the people themselves to organize battalions and other units. As a result of this, organization depends largely upon local circumstances. In the case of guerrilla groups the standard of equipment is of a low order, and they must primarily depend for their sustenance upon what the locality affords.

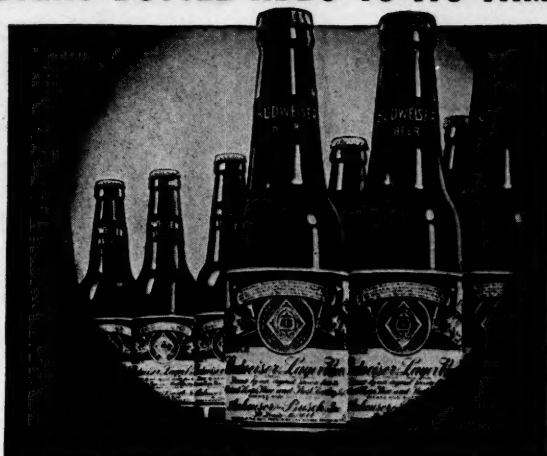
The strategy of guerrilla warfare is manifestly unlike that employed in orthodox operations, as the basic tactic of the former is constant activity and movement. There is in guerrilla warfare no such thing as a decisive battle; there is nothing comparable to the fixed, passive defense that features orthodox war. In guerrilla warfare the transformation of a moving situation into a positional defensive situation never arises. The general features of reconnaissance, partial deployment, general deployment, and development of the attack that are usual in mobile warfare are not common to guerrilla war.

There are differences also in the matter of leadership and command. In guerrilla warfare small units acting independently play the principal role and there must be no excessive interference with their activities. In orthodox warfare, particularly in a moving situation, a certain degree of initiative is accorded subordinates, but in principle, command is centralized. This is done because all units and all supporting arms in all districts must coordinate to the highest degree. In the case of guerrilla warfare this is not only undesirable but impossible. Only adjacent guerrilla units can coordinate their activities to any degree. Strategically, their activities can be roughly correlated with those of the regular forces, and tactically they must cooperate with adjacent units of the regular army. But there are no strictures on the extent of guerrilla activity nor is it primarily characterized by the quality of cooperation of many units.

When we discuss the terms "front" and "rear" it must be remembered, that while guerrillas do have bases, their primary field of activity is in the enemy's rear areas. They themselves have no rear. Because an orthodox army has rear installations (except in some special cases as during the 10,000 mile march of the Red Army or as in the case of certain units operating in Shansi province) it can not operate as guerrillas can.

As to the matter of military responsibilities: those of the guerrillas are to exterminate small forces of the enemy: to harass and weaken large forces; to attack enemy lines of communication; to establish bases capable of supporting independent operations in the enemy's rear; to force the enemy to disperse his strength, and to coordinate all these activities with those of the regular armies on distant battle fronts.

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From the foregoing summary of differences that exist between guerrilla and orthodox warfare it can be seen that it is improper to compare the two. Further distinction must be made in order to clarify this matter. While the 8th Route Army is a regular Army, its North China campaign is essentially guerrilla in nature for it operates in the enemy's rear. On occasion, however, 8th Route Army commanders have concentrated powerful forces to strike an enemy in motion and the characteristics of orthodox mobile warfare were evident in the battle at P'ing Hsing Kuan and in other engagements.

On the other hand, after the fall of Feng Ling Tu, the operations of Central Shansi, and Suiyan troops were more guerrilla than orthodox in nature. In this connection the practice character of Generalissimo Chiang's instructions to the effect that independent brigades would carry out guerrilla operations should be recalled. In spite of such temporary activities, these orthodox units retained their identity and after the fall of Feng Ling Tu they were not only able to fight along orthodox lines but often found it necessary to do so. This is an example of the fact that orthodox armies may, due to changes in the situation, temporarily function as guerrillas. Likewise guerrilla units that are formed from the people may gradually develop into regular units and when operating as such, employ the tactics of orthodox mobile war. While these units function as guerrillas they may be compared to innumerable gnats which, by biting a giant both in front and in rear, ultimately exhaust him. They make themselves as unendurable as a group of cruel and hateful devils, and as they grow and attain gigantic proportions they will find that their victim is not only exhausted but is practically perishing. It is for this very reason that our guerrilla activities are a source of constant mental worry to Imperial Japan.

While it is improper to confuse orthodox with guerrilla operations it is equally improper to consider that there is a chasm between the two. While differences do exist, similarities appear under certain conditions and this fact must be appreciated if we wish to establish clearly the relationship between the two. If we consider both types of warfare as a single subject, or if we confuse guerrilla warfare with the mobile operations of orthodox war we fall into this error: we exaggerate the function of guerrillas and minimize that of the regular armies. If we agree with Chang Tso Hua who says "Guerrilla warfare is the primary war strategy of a people seeking to emancipate itself"; or with Chao K'ang who believes that "Guerrilla strategy is the only strategy possible for an oppressed people" we are exaggerating the importance of guerrilla hostilities. What these zealous friends I have just quoted do not realize is this: That if we do not fit guerrilla operations into their proper niche we can not promote them realistically. Then, not only would those who oppose us take advantage of our varying opinions to turn them to their own uses to undermine us, but guerrillas would be led to assume responsibilities they could not successfully discharge and which should properly be carried out by orthodox forces. In the meantime the important guerrilla function of coordinating activities with the regular forces would be neglected. Furthermore, if the theory that guerrilla warfare is our only strategy were actually applied, the regular forces would be

weakened, we would be divided in purpose, and guerrilla hostilities would decline. If we say: "Let us transform the regular forces into guerrillas" and do not place our first reliance on a victory to be gained by the regular armies over the enemy we may certainly expect to see as a result the failure of the anti-Japanese war of resistance. The concept that guerrilla warfare is an end in itself and that guerrilla activities can be divorced from those of the regular forces is correct. If we assume that guerrilla warfare does not progress from beginning to end beyond its elementary forms we have failed to recognize the fact that guerrilla hostilities can, under specific conditions, develop and assume orthodox characteristics. An opinion that admits the existence of guerrilla war but isolates it is one that does not properly estimate the potentialities of such war.

Equally as dangerous is the concept which condemns guerrilla war on the grounds that war has no other aspects than the orthodox. This opinion is expressed by those who have seen the corrupt phenomena of some guerrilla regimes, observed their lack of discipline, and have seen them used as a screen behind which certain persons have indulged in bribery and other corrupt practices. These people will not admit the fundamental necessity for guerrilla bands which spring from the armed people. They say: "Only the regular forces are capable of conducting guerrilla operations." This theory is a mistaken one and would lead to the abolition of the people's guerrilla war.

A proper conception of the relationship that exists between guerrilla effort and that of the regular forces is essential. We believe it can be stated this way: "Guerrilla operations during the anti-Japanese war may for a certain time and temporarily become its paramount feature, particularly insofar as the enemy's rear is concerned. However, if we view the war as a whole there can be no doubt that our regular forces are of primary importance because it is they who are alone capable of producing the decision. Guerrilla warfare assists them in producing this favorable decision. Orthodox forces may under certain conditions operate as guerrillas, and the latter may, under certain conditions, develop to the status of the former. However, both guerrilla forces and regular forces have their own respective development and their proper combinations."

To clarify the relationship between the mobile aspect of orthodox war and guerrilla war, we may say that general agreement exists that the principal element of our strategy must be mobility. With the war of movement we may at times combine the war of position. Both of these are assisted by general guerrilla hostilities. It is true that on the battlefield mobile war often becomes positional; it is true that this situation may be reversed; it is equally true that each form may combine with the other. The possibility of such combination will become more evident after the prevailing standards of equipment have been raised. For example in a general strategical counter attack to recapture key cities and lines of communication it would be normal to use both mobile and positional methods. However, the point must again be made that our fundamental strategical form must be the war of movement. If we deny this we can not arrive at the victorious solution of the war. In sum, while we must promote guerrilla warfare as a necessary strategical auxiliary to orthodox operations we must neither assign it the primary position in our war strategy,



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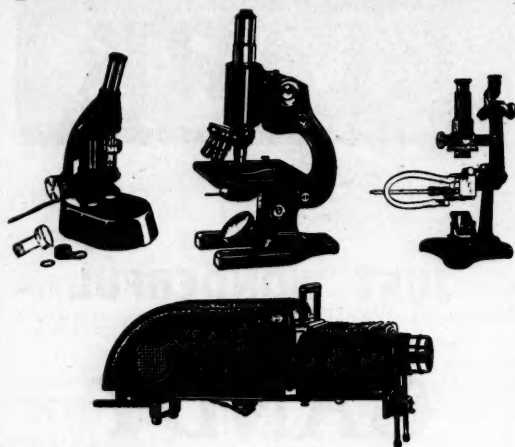
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nor may we substitute it for mobile and positional warfare as conducted by orthodox forces.

PART THREE

GUERRILLA WARFARE IN HISTORY

Guerrilla warfare is neither a product of China nor is it peculiar to the present day. From the earliest historical days it has been a feature of wars fought by every class of men against invaders and oppressors. Under suitable conditions it has great possibilities. The many guerrilla wars in history have their points of difference, their peculiar characteristics, their varying processes and conclusions, and we must respect and profit by the experience of those whose blood was shed in them. What a pity it is that the priceless experience gained during the several hundred wars waged by the peasants of China can not be marshalled today to guide us. Our only experience in guerrilla hostilities has been that gained from the several conflicts that have been carried on against us by foreign imperialism. But those experiences should help the fighting Chinese recognize the necessity for guerrilla warfare and should confirm them in confidence of ultimate victory.

In September 1812 the French Napoleon, in the course of swallowing all of Europe, invaded Russia at the head of a great army totalling several hundred thousands infantry, cavalry and artillery. At that time Russia was weak and her ill prepared army was not concentrated. The most important phase of her strategy was the use made of cosack cavalry and detachments of peasants to carry on guerrilla operations. After giving up Moscow the Russians formed nine guerrilla divisions of about five hundred men each. These and vast groups of organized peasants carried on partisan warfare and continually harassed the French army. When the French army was withdrawing, cold and starving, Russian guerrillas blocked the way and in combination with regular troops carried out counter attacks on the French rear, pursuing them and defeating them. The army of the heroic Napoleon was almost entirely annihilated and the guerrillas captured many officers, men, cannon and rifles. Though the victory was the result of various factors, and depended largely on the activities of the regular army, the function of the partisan groups was extremely important. "The corrupt and poorly organized country that was Russia defeated and destroyed an army led by the most famous soldier of Europe and won the war in spite of the fact that her ability to organize guerrilla regimes was not fully developed. At times guerrilla groups were even hindered in their operations and the supply of equipment and arms was insufficient. If we use the Russian saying, it was a case of a battle between "the first and the axe." (Ivanoff.)

From 1918 to 1920 the Russian Soviets due to the oppositions and intervention of foreign imperialisms and the internal disturbances of White Russian groups were forced to organize themselves in occupied territories and fight a real war. In Siberia and Alashan, in the rear of the army of the traitor Denikin and in the rear of the Poles there were many Red Russian Guerrillas. These not only disrupted and destroyed the communications in the enemy's rear but also frequently prevented his advance. On one occasion the guerrillas completely destroyed a retreating White

army that had previously been defeated by regular Red forces. Kolchak, Denikin, the Japanese, and the Poles, owing to the necessity of staving off the attacks of guerrillas were forced to withdraw regular troops from the front. "Thus not only was the enemy's man power impoverished but he found himself unable to cope with the ever moving guerrillas." (The Nature of Guerrilla Action.)

The development of guerrillas at that time had only reached the stage where there were detached groups of several thousands in strength, old, middle aged, and young. The old men organized themselves into propaganda groups known as "silver haired units"; there was a suitable guerrilla activity for the middle aged; the young men formed the combat units, and there were even groups for the children. Among the leaders were determined communists who carried on general political work among the people. These, although they opposed the doctrine of extreme guerrilla warfare were quick to oppose those who condemned it. Experience tells us "Orthodox armies are the fundamental and principal power; guerrilla units are secondary to them and assist in the accomplishment of the mission assigned the regular forces." (Lessons of the Civil War in Russia.) Many of the guerrilla regimes in Russia gradually developed until in battle they were able to discharge the functions of organized regulars. The army of the famous General Galen was entirely derived from guerrillas.

During the seven months in 1935-1936 the Abyssinians lost their war against Italy. The cause of defeat, aside from the most important political reasons that there were dissentient political groups, no strong party, and unstable policy, was the failure to adopt a positive policy of mobile warfare. There was never a combination of the war of movement with large scale guerrilla operations. Ultimately the Abyssinians adopted a purely passive defense with the result that they were unable to defeat the Italians. In addition to this, the facts that Abyssinia is a relatively small and sparsely populated country were contributory. Even in spite of the fact that the Abyssinian army and its equipment was not modern, she was able to withstand a mechanized Italian force of 400,000 for seven months. During that period there were several occasions when a war of movement was combined with large scale guerrilla operations to strike the Italians heavy blows. Moreover, several cities were re-taken and casualties totalling 140,000 were inflicted. Had this policy been steadfastly continued it would have been difficult to have named the ultimate winner. At the present time guerrilla activities continue in Abyssinia and if the internal political questions can be solved an extension of such activities is probable.

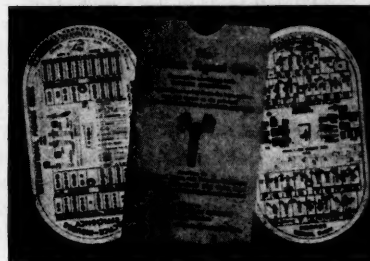
In 1841 and 1842 when brave people from San Yuan Li fought the English; again from 1850 to 1864 during the T'ai P'ing war, and for a third time in 1899 in the Boxer uprising guerrilla tactics were employed to a remarkable degree. Particularly was this so during the T'ai P'ing war when guerrilla operations were most extensive and the Ch'ing troops were often completely exhausted and forced to flee for their lives.

In these wars there were no guiding principles of guerrilla action. Perhaps these guerrilla hostilities were not carried out in conjunction with regular operations, or perhaps there was a lack of coordination. But the fact that victory was not gained was not because of any lack in

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guerrilla activity but rather because of the interference of politics in military affairs. Experience shows that if precedence is not given to the question of conquering the enemy both in political and military affairs, and if regular hostilities are not conducted with tenacity, guerrilla operations alone can not produce final victory.

From 1927 to 1936 the Chinese Red Army fought almost continually and employed guerrilla tactics constantly. At the very beginning a positive policy was adopted. Many bases were established and from guerrilla bands the Reds were able to develop into regular armies. As these armies fought, new guerrilla regimes were developed over a wide area. These regimes coordinated their efforts with those of the regular forces. This policy accounted for the many victories gained by guerrilla troops relatively few in number who were armed with weapons inferior to those of their opponents. The leaders of that period properly combined guerrilla operations with a war of movement both strategically and tactically. They depended primarily upon alertness. They stressed the correct basis for both political affairs and military operations. They developed their guerrilla bands into trained units. They then determined upon a ten-year period of resistance during which time they overcame innumerable difficulties and have only lately reached their goal of direct participation in the anti-Japanese war. There is no doubt that the internal unification of China is now a permanent and definite fact and that the experiences gained during our internal struggles have proved to be both necessary and advantageous to us in the struggle against Japanese imperialism. There are many valuable lessons we can learn from the experiences of those years. Principal among them is the fact that guerrilla success largely depends upon powerful political leaders who work unceasingly to bring about internal unification. Such leaders must work with the people; they must have a correct conception of the policy to be adopted both as regards the people and the enemy.

After September 18th, 1931, strong anti-Japanese guerrilla campaigns were opened in each of the three northeast provinces. Guerrilla activity persists there in spite of the cruelties and deceptions practised by the Japanese at the expense of the people, and in spite of the fact that their armies have occupied the land and oppressed the people for the last seven years. The struggle can be divided into two periods. During the first, which extended from September 18th, 1931, to January, 1933, anti-Japanese guerrilla activity exploded constantly in all three provinces. Ma Chan Shan and Ssu Ping Wei established an anti-Japanese regime in Hei Lung Chiang. In Chi Lin the National Salvation Army and the Self Defense Army were led by Wang Te Lin and Li Tu respectively. In Feng T'ien, Chu Lu and others, commanded guerrilla units. The influence of these forces was great. They harassed the Japanese unceasingly but because there was an indefinite political goal; improper leadership; failure to coordinate military command and operations and to work with the people, and finally failure to delegate proper political functions to the army, the whole organization was feeble, and its strength was not unified.

As a direct result of these conditions the campaigns failed and the troops were finally defeated by our enemy.

During the second period, which has extended from

January, 1933, to the present time, the situation has greatly improved. This has come about because great numbers of people who have been oppressed by the enemy have decided to resist him; because of the participation of the Chinese communists in the anti-Japanese war, and because of the fine work of the volunteer units. The guerrillas have finally educated the people to the meaning of guerrilla warfare and in the northeast it has again become an important and powerful influence. Already seven or eight guerrilla regiments and a number of independent platoons have been formed, and their activities make it necessary for the Japanese to send troops after them month after month. These units hamper the Japanese and undermine their control in the northeast while at the same time they inspire a Nationalist revolution in Korea. Such activities are not merely of transient and local importance but are direct contributions to our ultimate victory. However, there are still some weak points. For instance: national defense policy has not been sufficiently developed; participation of the people is not general; internal political organization is still in its primary stages, and the force used to attack the Japanese and the puppet governments is not yet sufficient. But if present policy is continued tenaciously all these weaknesses will be overcome. Experience proves that guerrilla war will develop to even greater proportions and that, in spite of the cruelty of the Japanese and the many methods they have devised to cheat the people they can not extinguish guerrilla activities in the three northeastern provinces.

The guerrilla experiences of China and of other countries which have been outlined prove that in a war of revolutionary nature such hostilities are possible, natural and necessary. They prove that if the present anti-Japanese war for the emancipation of the masses of the Chinese people is to gain ultimate victory such hostilities must expand tremendously. Historical experience is written in iron and blood. We must point out that the guerrilla campaigns being waged in China today are a page in that history that has no precedent. Their influence will be confined not solely to China in her present anti-Japanese war but will be world wide.

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PART FOUR

CAN VICTORY BE ATTAINED BY GUERRILLA OPERATIONS?

Guerrilla hostilities are but one phase of the war of resistance against Japan and the answer to the question of whether or not they can produce ultimate victory can be given only after investigation and comparison of all elements of our own strength with those of the enemy. The particulars of such a comparison are many. First, the strong Japanese bandit nation is an absolute monarchy. During the course of her invasion of China she had made comparative progress in the techniques of industrial production and in the development of excellence and skill in her army, navy, and air force. But in spite of this industrial progress she remains an absolute monarchy of inferior physical endowments. Her man power, her raw materials and her financial resources are all inadequate and insufficient to maintain her in protracted warfare or to meet the situation presented by a war prosecuted over a vast area. Added to this is the anti-war feeling now manifested by the Japanese people, a feeling which is shared by the junior officers and more extensively, by the soldiers of the invading army. Furthermore, China is not Japan's only enemy. Japan is unable to employ her entire strength in the attack on China; she can not, at most, spare more than 1,000,000 men for this purpose as she must hold any in excess of that number for use against other possible opponents. Because of these important primary considerations the invading Japanese bandits can hope neither to be victorious in a protracted struggle nor to conquer a vast area. Their strategy must be one of lightning war and speedy decision. If we can hold out for three or more years it will be most difficult for Japan to bear up under the strain.

In the war the Japanese brigands must depend upon lines of communication linking the principal cities as routes for the transport of war materials. The most important considerations for her are that her rear be stable and peaceful and that her lines of communication be intact. It is not to her advantage to wage war over a vast area with disrupted lines of communication. She can not disperse her strength and fight in a number of places and her greatest fears are thus eruptions in her rear and disruption of her lines of communication. If she can maintain communications she will be able at will to speedily concentrate powerful forces at strategic points to engage our organized units in decisive battle. Another important Japanese objective is to profit from the industries, finances, and man power in captured areas and with them to augment her own insufficient strength. Certainly it is not to her advantage to forego these benefits, nor to be forced to dissipate her energies in a type of warfare in which the gains will not compensate for the losses. It is for these reasons that guerrilla warfare conducted in each bit of conquered territory over a wide area will be a heavy blow struck at the Japanese bandits. Experience in the five northern provinces as well as in Kiangsu, Che Kiang and An Hui has absolutely established the truth of this assertion.

2.

China is a country half colonial and half feudal; it is a country which is politically, militarily, and economically backward. This is an inescapable conclusion. It is a vast a country in which the terrain is complicated and the fa-

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cilities for communication are poor. All these factors favor country with great resources and tremendous population; a protracted war; they all favor the application of mobile warfare and guerrilla operations. The establishment of innumerable anti-Japanese bases behind the enemy's lines will force him to fight unceasingly in many places at once both to his front and his rear. He thus endlessly expends his resources.

We must unite the strength of the army with that of the people; we must strike the weak spots in the enemy's flanks; in his front; in his rear. We must make war everywhere and thus cause dispersal of his forces and dissipation of his strength. Thus the time will come when a gradual change will become evident in the relative position of ourselves and our enemy and when that day comes it will see the beginning of our ultimate victory over the Japanese.

3.

Although China's population is great it is unorganized. This is a weakness which must be taken into account. The Japanese bandits have invaded our country not merely to conquer territory but to carry out the violent, rapacious and murderous policy of their government which is the extinction of the Chinese race. For this compelling reason we must unite the nation without regard to parties or classes and follow our policy of resistance to the end. China today is not the China of old. It is not like Abyssinia. China today is at the point of her greatest historical progress. The standards of literacy among the masses have been raised; the rapprochement of communists and nationalists has laid the foundation for an anti-Japanese war front that is constantly being strengthened and expanded; government, army and people are all working with great energy; the raw material resources and the economic strength of the nation are waiting to be used; the unorganized people is becoming an organized nation. These energies must be directed toward the goal of protracted war so that should the Japanese occupy much of our territory or even most of it, it is we who will gain final victory. Not only must those behind our lines organize for resistance but also those who live in Japanese occupied territory in every part of the country must do the same. The traitors who accept the Japanese as fathers are few in number and those who have taken oath that they would prefer death to abject slavery are many. If we resist with this spirit what enemy can we not conquer and who can say that ultimate victory will not be ours?

The Japanese are waging a barbaric war along uncivilized lines. For that reason Japanese of all classes oppose the policies of their government, as do vast international groups. On the other hand, because China's cause is righteous, our countrymen of all classes and parties are united to oppose the invader; we have sympathy in many foreign countries, including even Japan itself. This is perhaps the most important reason why Japan will lose and China will win.

The progress of the war for the emancipation of the Chinese people will be in accord with these facts. The guerrilla war of resistance will be in accord with these facts, and that guerrilla operations correlated with those of our regular forces will produce victory is the conviction of the many patriots who devote their entire strength to guerrilla hostilities.

BRIGADIER GENERAL ARCHIBALD HENDERSON, U.S.M.C.

(Continued from page 18)

vessels that were subsequently converted to the use of the United States, retaining their original names. The following extract from the official report of Captain Charles Stewart, U.S.N., relating to the conduct of the Marines, is significant:

To Captain Henderson and Lieutenant Freeman, commanding the Marines, he owes his grateful thanks for the lively and well-directed fire kept up by the detachment under their command.

Henderson received a silver medal and was included in the thanks of Congress to officers and men of the *Constitution*, for their gallant service.

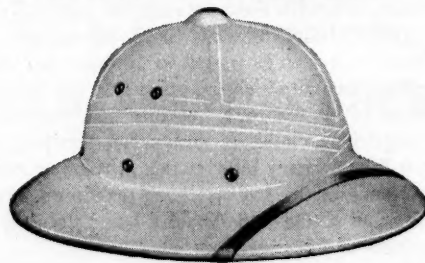
In addition to the thanks of Congress, and those of a grateful nation, he later was presented with a jeweled sword by the State of Virginia, bearing the following inscription:

Presented by the State of Virginia to Colonel Archibald Henderson, of the Marine Corps of the United States, in testimony of the high sense entertained by his native state of his gallantry and good conduct in the capture of the *Cyane* and *Levant* by the frigate *Constitution* on the 20th February, 1815, and his patriotic service generally during the war with Great Britain. Honor to the brave.

The reports show that Captain Stewart transmitted by Captain Henderson the flags of the captured vessels, *Cyane* and *Levant*, together with one of the *Constitution's* muskets to Secretary of the Navy B. W. Crowninshield, with the request that they be deposited in the Navy Department.

The years immediately following the close of the War of 1812, with the country tired of war and eager to turn to peaceful pursuits, appear to have been the most uneventful in the entire history of the Marine Corps. By the Peace Establishment Act of 1816 the Marine Corps, like the other armed forces of the nation, was severely

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dealt with by way of reductions in strength and appropriation. Fortunately, however, there lingered a recollection of the unhappy state of affairs following the complete disbandment after the close of the Revolutionary War, which soon invited serious troubles leading to war with various foreign nations upon their perceiving the defenseless position of the United States. During this time the Marine Corps seems to have suffered considerably, not only from loss in strength but also from the loss in morale which seems gradually to have ebbed, the latter perhaps for the want of more spirited leadership.

In the meantime Henderson had been assigned to shore duty at various stations on the New England coast—first as commanding officer of the Marine Barracks, Boston (Charlestown), Mass., which was followed by duty at Portsmouth, N. H. Later, during the winter of 1818-1819, he served at Headquarters, Washington, and acted as Commandant of the Marine Corps for a few months.

With the advent of the year 1820 the piratical activities in the West Indies and those off the coast of Louisiana together with other more or less disturbing activities in the Gulf region demanded increased attention on the part of the Navy and Marine Corps. Henderson forthwith proceeded to New Orleans and served as commanding officer of Marines at the naval station at that place. From all reports the Marines in the operations that followed gave good account of themselves.

Meanwhile affairs in the Marine Corps, generally, seem to have lapsed into a state of comparative repose. The President realizing the necessity for filling the office of Commandant of the Marine Corps, which had been vacant for a long time, finally appointed Henderson to the position.

On October 17, 1820, Henderson, then major by brevet, entered upon his duties as Lieutenant Colonel Commandant. Immediately he began the long up-hill task of building up the Marine Corps and of increasing its efficiency. In view of its record in three major wars, the Corps already had proven its wartime worth. A reputation based on traditions growing out of glorious deeds performed in war had already been formed which Henderson realized must be lived up to and perpetuated. But, what seems to have animated him most was his conception of a Marine Corps whose activities in addition to purely battle participation would also become a peacetime asset to the nation—his visualization of a bigger and better organization with a wider sphere of usefulness in both war and peace-time.

Soon after assuming the duties as Commandant, he personally inspected all the more important shore stations of the Corps and as many of the ships detachments as possible giving them directions, and making recommendations to the Department for the enlargement and improvement of barracks. He kept in almost constant communication with the Secretary of the Navy and others in authority never letting an opportunity pass without presenting the needs of the Marine Corps and for seeking within reason appropriations to meet such needs.

Commandant Henderson at all times vigorously insisted that the Marine Corps was strictly a military or-

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ganization, and as such its military bearing must be maintained, its *esprit de corps* fostered and built up in order to bring the Corps to the desired standard of efficiency. To that end he spared no efforts looking to the health of the personnel and the improvement and standardization of the uniform of the Corps.

From the very beginning his policy was that of maintaining the closest cooperation with the Navy. He personally supervised the training of his officers and kept in close touch with the training of the enlisted men. While not regarded as a harsh and unrelenting disciplinarian, he nevertheless considered discipline as a first requirement and demanded complete subordination on the part of all. In a number of instances he found it necessary to resort to courts-martial of offending officers. But, generally, it seems that his was the power, exerted through his own conduct and exemplary ways, for commanding respect and inspiring his officers and men to greater accomplishment.

In due course the Marine Corps, under the guiding hand of Colonel Henderson, came into its own and found its stride; and well that it did—eventful years were to follow. With the advent of the Eighteen-thirties, wider fields of usefulness occasioned by the rapid expansion and growth of the country were looming. During the third decade of the last century the Corps rendered invaluable aid to the civil authorities in a number of domestic disturbances, fought pirates in different parts of the world, protected Americans and their interests in Haiti and China, guarded the public property at all naval stations, and furnished a military force in support of Wilkes Exploring Expedition.

It was with the coming of the year 1836, however, that the Marine Corps was faced with the test of the proportions of a major war—that of supporting the Army in combating the Creek and Seminole Indians in the southeastern portion of the United States who had uprisen and were causing great distress and danger to the white inhabitants.

Soon after the breaking out of hostilities in the State of Georgia (May, 1836), at a time when the Indians were ravishing the country, and the disposable force of the Army was inadequate to deal with the emergency, Colonel Henderson volunteered his services, together with two battalions of the Marine Corps, for active duty in the field. The operations of the war that followed and Colonel Henderson's personal participation in this war have been chronicled in history. But, the following from one of the country's leading newspapers at the time, *The National Intelligencer*, of Washington, D. C. (June 2, 1836) reflects the situation and praises the Marines in a way that will be found interesting:

"The detachment of Marines under command of Colonel Henderson, which so promptly and handsomely volunteered to go against the Creek Indians, will leave here this morning aboard the *Columbia* for Norfolk where they will take passage to Charleston, S. C., on their route to the scene of savage warfare. This is another striking evidence of the great value of this arm of the national defense; it has shown itself as prompt to defend its country on the land as on the water, the element in which it was designed

originally, exclusively to act. Upon several occasions during the late war with England, detachments from this brave and highly disciplined Corps covered themselves with unfading laurels by their conduct while serving on land; and in every instance of conflict on the water its bravery and efficiency were attested by the official reports of the actions in which it bore a part. In the present emergency it did not wait even an intimation that its services would be acceptable, but promptly came forth, through its commanding officer, in the first hour of danger, and voluntarily offered to leave its comfortable quarters, and within one week from the offer we see a strong and well equipped detachment of fine-looking men bidding farewell to families and friends, and taking up the line of march to seek a savage and treacherous foe in distant land and in an inhospitable climate to stay the ravages of war, and to protect the innocent, the helpless, and the unoffending. They will carry with them the best and warmest wishes of all, that their success may be commensurate with their bravery and zeal."

The Columbus, Ga., *Sentinel*, of July 1, 1836, contained the following:

"The first battalion of the United States Marines, under the command of Colonel Henderson, is now stationed at Camp Henderson, fifteen miles below Columbus, on the western bank of the Chattahoochee. The battalion arrived at this place on the 23rd instant, having left Washington on the 1st, and Augusta on the 10th, marching from Augusta to this place in fourteen days, a distance of 224 miles. On their arrival here, orders were received from General Scott to proceed to their present station with all possible dispatch, and there erect a strong picket work, as a place of deposit for provisions, etc., for the eastern wing of the Army.

"The Marines bore an honorable and highly important part in the battle of Hatchee-Lustee, which began on January 22, 1837. The main body of the Army, under command of Major General Jessup, was put in motion on that day, to attack the Indians and negroes in the strongholds which they were said to occupy on the Hatchee-Lustee, in and near the Great Cypress Swamp and promptly and gallantly attacked.*** Colonel Henderson, leaving one company with the prisoners and horses entered the swamp with the remainder of his command, drove the enemy across the Hatchee-Lustee, passed that river under their fire, and drove them into a more dense and difficult swamp, in which they dispersed. A considerable force was ordered to support Colonel Henderson. When the troops reached the point where the Colonel had entered the swamp it was ascertained that he was in rapid pursuit of the enemy and fully able to overcome the force opposed to him.***

In his report, Colonel Henderson says, "The regular troops, both artillery and Marines, displayed great bravery and the most untiring and determined perseverance. The Marines, however, I cannot refrain from mentioning in a particular manner. The killed and wounded show where they were, and any other comment is rendered unnecessary from me."

The following order by General Jessup, was issued

from the Headquarters of the Army of the South, Tampa Bay, Florida, May 22, 1837:

"The presence of Colonel Henderson being required at the headquarters of his Corps, he will proceed to Washington City and report to the Adjutant General of the Army. The Major-General Commanding would be forgetful of what is due to merit, and would do injustice to his own feelings, were he to omit on the present occasion the expression of the high sense he entertains of the distinguished and valuable services rendered by the Colonel. He tenders him his warmest thanks for the able, zealous and cheerful support he has on every occasion received from him, both in Florida and Alabama; and begs him to accept his best wishes for his future fame and happiness."

The *National Intelligencer* in announcing the arrival of Colonel Henderson in Washington about the middle of June, 1837, said: *** "The gallant Corps, which it is the good fortune of Colonel Henderson to command, has always been distinguished wheresoever duty has called it. In the present case the Corps deserves peculiar commendation from having volunteered in the war in Florida, and having repaired to its theatre a thousand miles distant, to share in its perils and privations. Its commander deserves the praise of having proven himself worthy of his post, both by his gallantry in the field, and by his patience and good example under all difficulties; and he, his officers, and men have most honorably maintained the pledge which they gave to the government and to their country when they first tendered their services."***

After the return of Colonel Henderson to his duties at Headquarters, the Marines remained in Florida for a time under the command of the veteran Colonel Samuel Miller.

By these acts Henderson doubtless did a great deal in placing the Marine Corps in a favorable light with the federal government and in the minds of the American people. He continued personally to supervise the affairs of the Marine Corps in the same energetic manner.

Following the Florida Indian War, General Henderson (who had been brevetted brigadier general, January 27, 1837), maintained his direct leadership in times of national emergency by directing the operations of the Marines in person.

A comparatively brief time was to intervene before the coming of other great events—the conquest of California in 1845-46 and the Mexican War in which the participation of the Marine Corps in both the naval and land operations is too well known for comment other than saying such outstanding service on the part of an organization that numbered less than five thousand officers and men, on four fronts, is notable and reflected rare leadership.

Even after the close of the Mexican War General Henderson was destined to remain as Commandant for another decade. The further rapid growth and expansion of the country was demanding more and more from the Marine Corps both at home in aiding the civil authorities in quelling disturbances and in foreign lands promoting and protecting American interests. During this ten-year period the Marine Corps, under the ever watch-



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ful eye and direction of its venerable Commandant (who, it has been jocularly said had come to regard the Marine Corps as "his own"), was by no means an idle organization.

Foreseeing the creation of a larger navy General Henderson's policy and attention to an even greater degree turned to increasing the Marine detachments on board the vessels, prior to the greatest war of all, in which the services of the Marine Corps were devoted mostly to sea duty.

By this time the Civil War was near at hand and General Henderson's career was drawing to a close. He died in office on January 6, 1859. His funeral was conducted at the Marine Barracks, Washington, four days later and was attended by the President of the United States with his cabinet and many high ranking officers of all branches of the service, both military and civil, besides a host of friends. He was interred in Congressional Cemetery, Washington, D. C.

Again, Honor to the Brave.

MARINE CORPS RIFLE TESTS

(Continued from page 17)

rifles were found to be 100 per cent interchangeable in their respective types of weapons. Since the Winchester rifles were not production models, they were not included.

Test XXXIII—Although all of the semi-automatic rifles had numerous malfunctions, such as failure to feed, to lock, or to eject when dirty and corroded ammunition was used, their performance was considered equally satisfactory. There were surprisingly few failures to extract in this test. No difficulty was experienced with the M-1903 rifle.

Test XXVIII—When fired at night, the flash was uniform in the various types of rifles, except that the flash from the Winchester with 22-inch barrel was more excessive than with the other rifles.

FIELD FIRING UNDER FAIR TO IDEAL CONDITIONS

In the series of five tests, extending over a period of three days, it was assumed that troops had the opportunity to give their rifles normal field care and cleaning at the end of each day's firing, that weather conditions were



Cross-section of the Winchester barrel, showing gasport leading through barrel-lug into the gas chamber.

good, and that dust, dirt and sand encountered was similar to that found in ordinary open terrain in the United States. Throughout these tests, all rifles performed with very few minor malfunctions.

Test VIII—The comparative rates of fire against flying aircraft (mean slant range approximately 400 yards) on a coming course, at a speed of about 100 miles per hour, were as follows (average of four courses).

	Shots per score
M-1903	4.38
M-1	7.44
Johnson	9.63
Winchester	7.56

Test IX—The effective rates of fire at field targets was determined by engaging six type E and four type F silhouette targets on a combat range at a mean distance of approximately 325 yards. Targets were exposed for five minutes for each score. Distribution of fire as well as actual number of hits was emphasized.

Rifle	Shots per min.	Hits per min.	% Efficiency
M-1903	8.8	3.85	0.437
M-1	12.0	4.23	0.352
Johnson	10.25	4.30	0.419
Winchester	11.88	6.02	0.507

Test X—Two type E silhouette targets, mounted about six feet apart in a common carrier and crossing the line of fire at a mean range of 300 yards and at an average speed of 150 yards per minutes, were engaged "to determine the effective rate of fire at individual moving targets."

Rifle	Shots per min.	Hits per min.	% Efficiency
M-1903	14.45	3.27	.226
M-1	19.10	3.54	.181
Johnson	19.81	2.82	.142
Winchester	17.68	2.94	.166

Test XI—Firing procedure was similar to that outlined for Test X, except that a large target, representing a combat vehicle, was used.

Rifle	Shots per min.	Hits per min.	% Efficiency
M-1903	16.20	10.20	.629
M-1	23.15	12.85	.555
Johnson	23.85	11.00	.462
Winchester	29.45	17.30	.586

Test XXI—In this test, the Board concluded that all types of weapons can be handled when heated during combat, which involves fire movement (rush, crawl, creep) even though the barrels are hot.

FIELD FIRING UNDER ADVERSE CONDITIONS

This series of tests simulated field conditions which members of the Board had seen duplicated in the field. Although some of them were undoubtedly severe, it was believed that they had to approach the extreme in order to be at all conclusive. In no single instance was a test devised for the purpose of creating a failure of a weapon.

Test XII—When exposed to heavy dust, the semi-auto-

matics will probably fail to operate as self-loaders, although they can be manually operated without much difficulty. The M-1903 will operate normally except that the bolt will be slightly stiff. A liberal application of light gun oil on the locking cams and operating rod guides will probably permit all the rifles to function reasonably well under these conditions.

Test XIII—Rifles and ammunition were placed under a fresh water sprinkler for a period of fourteen hours, the water being turned off and on at two-hour intervals to simulate a march through heavy intermittent rain prior to going into action. "Under the conditions of this test, the M-1903 rifle functioned satisfactorily throughout, while the semi-automatic rifles averaged 20% malfunctions until lubricated. It is believed that all of these semi-automatic rifles would have to be field stripped, cleaned and oiled after being exposed to rain for several hours, if normal functioning is to be assured."

Test XVI—After submersion in a mud bath of thin consistency, none of the rifles will function satisfactorily. "The M-1903 rifle can be operated, however, although the bolt became harder to operate as the test progressed. Of the semi-automatic rifles, the Johnsons proved superior in that they could be manually operated throughout the test with comparative ease. After exposure under the conditions of this test, the Johnson and Winchester rifles must be completely disassembled and cleaned, including the recoil mechanism contained in the butt stocks, whereas the M-1903 and M-1 rifles can be cleaned by normal field stripping, cleaning and lubricating."

Test XVII and XVII(a)—It was assumed "that troops have landed through light surf and that rifles were dropped or dragged over wet sand in reaching cover on the beach. Rifles were thoroughly sprayed with sea water and dragged back and forth several times in wet beach sand. As much sand as possible was removed by shaking the rifles, by blowing, and by cleaning exposed parts with the hand."

The M-1903 rifles could be operated with some difficulty. The M-1 rifles could not be manually operated after the second or third shot. The Johnson rifles failed to operate as semi-automatic weapons, although they were operated by hand with ease. Although the Winchester rifles tended to operate mechanically on a greater percentage of shots than the other two semi-automatic rifles, manual operation, when necessary, was extremely difficult.

After exposure to the conditions of this test, all these rifles must be field stripped, cleaned, and lubricated to assure normal functioning. "The comparative efficiency of these rifles for the entire test (XVII and XVII(a)) is believed to be as follows: M-1903; Johnson; Winchester; M-1."

In Tests XVIII and XX, the rifles and ammunition were completely submerged in clean sea water for 10 and 5 minutes and left exposed without cleaning for 17 hours and 42 hours respectively. The Board concluded that "submersion in clean sea water (free of sand), and exposure as set forth in the conditions of the tests, will not put any of these weapons completely out of action, but

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that a liberal application of oil is necessary for satisfactory operation."

Test XXIII—Rifles were left exposed overnight without cleaning, and were then fired with occasional fresh water spray to represent intermittent showers during combat. As a result of this test, the Board was of the opinion that "all weapons became increasingly difficult to operate as the test continued and, unless liberally lubricated, may cease functioning altogether when exposed to heavy showers."

Test XXXII simulated firing in combat during a hard, steady rain. Rain, improvised by using the fine spray from a garden hose nozzle, was placed on the shooters, rifles and ammunition while an attempt was made to fire 75 shots at the normal rapid-fire rate (15 shots per minute).

The Board's opinion was that "heavy rain tends to wash off the lubricant and leave a film of accumulated dirt and oil residue. If the rifles are fired during rain, the de-lubricating process is accelerated. None of the rifles will function normally under the conditions of this test."

In Tests XXIX and XXIX(a), the rifles were completely disassembled, the parts washed in gasoline, and reassembled without any lubricant prior to firing. Care was taken during firing to prevent dirt or sand from adhering to the cartridges when fed into the magazine. "The gas operated weapons and the M-1903 have sufficient tolerances in the moving parts to operate without lubrication for considerable firing, provided no dirt or other foreign material is present and the parts have not been burred or distorted . . . the Johnson rifle would not function normally for any appreciable length of time without lubrication. Since the Johnson rifles furnished for these tests were not new rifles, it was impracticable to determine a definite cause for . . . (these results)."

ENDURANCE AND FATIGUE TESTS

The purpose of Test XXXIV was to determine (a) "the ability of the various weapons to fire a minimum of 12,000 rounds, including previous test firing; (b) ruggedness and serviceability as indicated by broken, defective, or replaced parts; and (c) relative accuracy after firing 9,000 rounds" (see Accuracy phase above).

In this test, rifles were fired from an improvised rest in series of 150 rounds each at the rate of 15 shots per minute. Rifles were then cooled with water and compressed

Type of Rifle	Malfunctions	Average Number of Parts Broken, Replaced or Repaired Per Weapon
M-1903	53.00	3.00
M-1	370.00	12.25
Johnson	773.50	36.00
Winchester*	892.00	36.00

*Only one Winchester rifle completed the test, the others being withdrawn as broken parts occurred for which no spare parts were available.

air and the procedure repeated. They were lubricated at intervals of 600 rounds, although as the test progressed it became necessary to lubricate more frequently.

The total failures to function throughout the entire test of approximately 12,000 rounds, and the comparative ruggedness and serviceability of the weapons are indicated in the table on this page.

CONCLUSIONS

In addition to the facts and opinions set forth above, the Board believed that the tests indicate:

"(a) The semi-automatic rifles produce a larger volume of fire and attain a larger number of hits than the M-1903, against indistinct field targets (silhouette) in a given length of time.

"(b) In sustained firing for a period of several minutes, the fatigue to personnel firing the M-1903 rifle is considerably more than to personnel firing the semi-automatic rifles. This reduces the comparative rate of fire and number of effective hits of the M-1903 rifle."

It is realized that "the results obtained from only two or four rifles of a type are not entirely conclusive. However, the rifles of each type reacted so uniformly under the conditions of the various tests that the Board could only conclude that they were actually representative of the type submitted."

"The bolt operated U. S. Rifle, Caliber .30, M-1903 stands out as the most dependable weapon submitted to the Board for consideration. The self-loading weapons are impressive with their volume of fire, which is essential against aircraft within range and fast moving ground targets. These weapons are, however, subject to many stoppages and it is quite evident that their functioning efficiency varies with conditions under which the weapons are subjected."

"The Board realizes that only a certain proportion of the rifles in any one operation, such as a landing, will be subjected to the severest conditions, and that the remainder will function normally. When a large force armed with semi-automatics is employed it will lose a portion of its fire power through the malfunctions or breakages of individual rifles and yet attain superior fire power to a similar force armed with the bolt-operated rifle."

"It became increasingly evident as the tests progressed that the M-1 rifle was superior to the other semi-automatic rifles. Although it failed on some of the abuse tests, it was in general much more reliable in mechanical operation, in ruggedness, and in freedom from repairs or replacements than either the Johnson or Winchester rifles."

Considering the test as a whole, the Board believed "that the comparative standings of the four types of rifles competing in these tests is as follows: Springfield, Garand, Johnson, and Winchester."

It will be noted that this standing is in accordance with the length of time each rifle has been under development. Each of the three types of semi-automatic rifles has certain desirable characteristics. Modifications which will improve their reliability under all conditions are being made now and undoubtedly will continue to be made in the future. At the present time, however, the Marine Corps feels that its test conclusively proved that the M-1 rifle is the most satisfactory semi-automatic rifle available.

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The Board of Officers of the Association will act as the Board of Judges. Any or all articles submitted will be subject to publication, with honorable mention, in the Marine Corps Gazette at the usual rates. All manuscripts submitted will become the property of the Marine Corps Association. None will be returned.



★ The November 1941 number
of the Gazette will announce
the results of the competition.

SOME EXPERIENCES IN FREE CHINA

(Continued from page 13)

reached the vicinity of the craters, all of the wounded had been removed, which speaks well for the Air Raid Precautions organization here. But the dead still lay where they had been hastily gathered. There were some seven or eight corpses strewn about at this one spot in various stages of dismemberment. It was a grisly mess, and I hadn't the heart to take a picture, though I held my camera in my hand.

The following morning I had an appointment in the city. The weather was fair and it seemed likely that another air raid was in prospect, but I couldn't very well cancel an appointment on account of fair weather, so I set out anyway. I had only just left the ferry and climbed to the street level when the preliminary alarm was hoisted. I was just turning to retrace my steps when I encountered a colleague who was also returning to the Embassy. He suggested that we "thumb" a ride in the private sampan (small boat) of some foreign acquaintance rather than attempt to fight our way onto the ferry. At such times a large number of Chinese seek to cross to the relative safety of the South Bank, consequently the ferry is dangerously overcrowded. We made our way to a nearby sampan landing, but looked in vain for the sampan of an acquaintance. But we did note the sampan of a Chinese official who had not yet arrived. His wife was already in the boat, and anxiously waiting for her husband to join her. She was agreeable to our crossing with them so we clambered aboard. Then followed many long minutes while other sampans filled and departed, but still the Master did not come. It seemed that it was almost time for the second alarm when the lady finally decided that her husband had either crossed on the ferry or sought shelter in a dugout in the city. We then shoved off and crossed without incident. And it was only an hour later that bombs were blasting the very spot where we had sat so long in the sampan! The term "time and space factor" has had concrete meaning for me since that date.

When I was a youth I devoured books and stories of adventure, and hoped that I might some day have adventures of my own. Well—I was to find that life in the Marine Corps is not yet exactly prosaic.

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of good taste. You are entitled to all these things in
a cigarette and you get them in Chesterfield's right
combination of the world's best cigarette tobaccos.

EVERYWHERE YOU GO...*They Satisfy*